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In the Supreme Court of the United States

OCTOBER TERM, 1978

INDUSTRIAL UNION DEPARTMENT, AFL-CIO,
PETITIONER

v.

AMERICAN PETROLEUM INSTITUTE, ET AL.

RAY MARSHALL, SECRETARY OF LABOR, PETITIONER

v.

AMERICAN PETROLEUM INSTITUTE, ET AL.

ON WRIT OF CERTIORARI TO THE UNITED STATES COURT OF APPEALS FOR THE FIFTH CIRCUIT

BRIEF FOR THE FEDERAL PARTIES

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INDEX

	Page
Opinions below	1
Jurisdiction	2
Questions presented	2
Statute involved	3
Statement	4
A. The Occupational Safety and Health Act	5
B. Previous benzene standards	9
C. The permanent standard	13
D. The basis for the standard	15
1. Toxic effects of benzene	15
2. The policy of the lowest feasible level of exposure	20
3. Feasibility	25
4. Protective clothing	25
5. The percentage exclusion	28
E. The decision of the court of appeals	30
Summary of Argument	35
Argument	40
I. The Occupational Safety and Health Act does not require the Secretary to establish that the costs of particular reductions in exposure to toxic substances are justified by quantifiable benefits	40

Argument—Continued Page

A. The definitional phrase "reasonably necessary or appropriate" does not impose a cost-benefit test 42

B. Section 655(b)(5) prohibits basing a standard on a cost-benefit test.... 48

1. The legislative history establishes that Congress wanted the Secretary to regulate toxic substances by considering costs only as part of "feasibility".... 49

2. The requirement that standards be "feasible" refers to practicability rather than to a cost-benefit balance 55

3. The requirement that the Secretary make decisions on the basis of the "best available evidence" precludes any role for cost-benefit analysis if the necessary data are not "available 60

C. Any ambiguities in the statute should be resolved in favor of greater safety 70

II. The Secretary was not required to wait for more evidence before restricting dermal contact with benzene-bearing liquids 74

Conclusion 83

Appendix 1a

CITATIONS

Cases: Page

American Iron and Steel Institute v. *OSHA*, 577 F.2d 825, petitions for cert. pending, Nos. 78-918 and 78-919 ..... 42, 45

American Trucking Associations v. *Atchison, Topeka & Santa Fe Ry.*, 387 U.S. 397 73

American Trucking Associations v. *United States*, 344 U.S. 298 44

Aqua Slide 'N' Dive Corp. v. *CPSC*, 569 F.2d 831 ..... 33, 46, 47

Associated Industries of New York State, Inc. v. *United States Department of Labor*, 487 F.2d 342 45

Atlantic & Gulf Stevedores, Inc. v. *OSHRC*, 534 F.2d 541 54

Atlas Roofing Co. v. *OSHRC*, 430 U.S. 442 5

Bowles v. *Willingham*, 321 U.S. 503 44

Bowman Transportation, Inc. v. *Arkansas-Best Freight System, Inc.*, 419 U.S. 281 77

CAB v. *Hermann*, 353 U.S. 322 82

Clark v. *Uebersee Finanz-Korp.*, 332 U.S. 480 61

E. I. duPont deNemours & Co. v. *Collins*, 432 U.S. 46 73

E. I. duPont deNemours & Co. v. *Train*, 430 U.S. 112 ..... 72, 74

Endicott Johnson Corp. v. *Perkins*, 317 U.S. 501 82

FCC v. *National Citizens Committee for Broadcasting*, 436 U.S. 775 44-45

FCC v. *Schreiber*, 381 U.S. 279 82

Cases—Continued — Page

FERC v. *Pennzoil Producing Co.*, No. 77-648 (Jan. 16, 1979) 45
Florida Peach Growers Ass'n, Inc. v. *United States Department of Labor*, 489 F.2d 120 45
FPC v. *Florida Power & Light Co.*, 404 U.S. 453 72
FPC v. *Texaco Inc.*, 417 U.S. 380 44-45
FPC v. *Transcontinental Gas Pipe Line Corp.*, 423 U.S. 326 ..... 75, 82
FTC v. *Simplicity Pattern Co.*, 360 U.S. 55 54
Great Atlantic & Pacific Tea Co. v. *FTC*, No. 77-654 (Feb. 22, 1979) 54
H & H Tire Co. v. *United States Department of Transportation*, 471 F.2d 350.. 31
Industrial Union Department, AFL-CIO v. *Hodgson*, 499 F.2d 467 ..... 42, 45
Jarecki v. *G.D. Searle & Co.*, 367 U.S. 303 58
Lilly v. *Grand Trunk Western R.R.*, 317 U.S. 481 72
Marshall v. *Barlow's, Inc.*, 436 U.S. 307.. 5
Miller v. *Youakim*, No. 77-742 (Feb. 22, 1979) 73
Moog Industries, Inc. v. *FTC*, 355 U.S. 411 82
Mourning v. *Family Publications Service, Inc.*, 411 U.S. 356 ..... 37, 44
NAACP v. *FPC*, 425 U.S. 662 70
Permian Basin Area Rate Cases, 390 U.S. 747 ..... 45, 69-70, 73
RMI Co. v. *Secretary of Labor*, No. 78-3312 (6th Cir. Mar. 13, 1979) 42
SEC v. *Chenery Corp.*, 332 U.S. 194 44

Cases—Continued — Page

SEC v. *Sloan*, 436 U.S. 103 54
Skidmore v. *Swift & Co.*, 323 U.S. 134.... 73-74
Society of the Plastics Industry, Inc. v. *OSHA*, 509 F.2d 1301, cert. denied, 421 U.S. 992 ..... 42, 45, 60
South Terminal Corp. v. *EPA*, 504 F.2d 646 71
Synthetic Organic Chemical Manufacturers Association v. *Brennan*, 503 F.2d 1155 45
Tagg Bros. & Moorhead v. *United States*, 280 U.S. 420 31
Thorpe v. *Housing Authority of the City of Durham*, 393 U.S. 268 44
Tiller v. *Atlantic Coast Line R.R.*, 323 U.S. 574 72
Train v. *Colorado Public Interest Research Group, Inc.*, 426 U.S. 1 48
Train v. *Natural Resources Defense Council, Inc.*, 421 U.S. 60 ..... 54, 74
Turner Co. v. *Secretary of Labor*, 561 F.2d 82 42
TVA v. *Hill*, 437 U.S. 153 41
Union Electric Co. v. *EPA*, 427 U.S. 246.. 41, 57
United States v. *Allegheny-Ludlum Steel Corp.*, 406 U.S. 742 45
United States v. *An Article of Drug * * * Bacto-Unidisk*, 394 U.S. 784 ..... 37, 44
United States v. *Bush & Co.*, 310 U.S. 371 45
United States v. *Carlo Bianchi & Co.*, 373 U.S. 709 75
United States v. *Culbert*, 435 U.S. 371..... 48
United States v. *Seaboard Air Line R.R.*, 361 U.S. 78 72

Cases—Continued Page

United States v. *Storer Broadcasting Co.*, 351 U.S. 192 44
Universal Camera Corp. v. *NLRB*, 340 U.S. 474 70
Utah Fuel Co. v. *National Bituminous Coal Commission*, 306 U.S. 56 82
Vermont Yankee Nuclear Power Corp. v. *Natural Resources Defense Council, Inc.*, 435 U.S. 519 82
Voris v. *Eikel*, 346 U.S. 328 72
Weinberger v. *Hynson, Westcott & Dunning*, 412 U.S. 609 ..... 58, 61
Wisconsin v. *FPC*, 373 U.S. 294 82

Constitution, statutes and regulations:

United States Constitution:

Fourth Amendment 5
Seventh Amendment 5

Clean Air Act, Section 211(c)(2)(A) and (B), to be codified at 42 U.S.C. 7545 (c)(2)(A) and (B) 56
Consumer Product Safety Act, 15 U.S.C. 2051 *et seq.*:

15 U.S.C. 2057 57
15 U.S.C. 2058(c)(1)(C) 47, 57
15 U.S.C. 2058(c)(1)(D) 47, 57
15 U.S.C. 2058(c)(2) 47
15 U.S.C. 2058(c)(2)(A) 33, 46
15 U.S.C. 2058(c)(2)(C) 47

Contract Work Hours and Safety Standards Act, 40 U.S.C. 327-333 6

Constitution, statutes and regulations—Continued Page

Energy Policy and Conservation Act of 1975, 42 U.S.C. 6201 *et seq.*:

Section 325, 42 U.S.C. 6295 57
Section 325(a), 42 U.S.C. 6295(a) 57

Longshoremen's and Harbor Workers' Compensation Act, 33 U.S.C. 901-950 .. 6
National Foundation on Arts and Humanities Act, 20 U.S.C. 951-960 6
Occupational Safety and Health Act of 1970, 29 U.S.C. 651 *et seq.*:

29 U.S.C. 651(b) 5, 52
29 U.S.C. 652(8) ..... *passim*
29 U.S.C. 652(9) 6
29 U.S.C. 652(10) 6
29 U.S.C. 653(b)(2) 6
29 U.S.C. 654(a)(1) 5, 52
29 U.S.C. 654(a)(2) 5
29 U.S.C. 655(a) 5, 6, 7, 53
29 U.S.C. 655(b) 2, 7
29 U.S.C. 655(b)(1) 7, 53, 81
29 U.S.C. 655(b)(5) ..... *passim*
29 U.S.C. 655(b)(6)(A) 8
29 U.S.C. 655(b)(6)(C) 52, 53
29 U.S.C. 655(b)(8) 7
29 U.S.C. 655(c) 7
29 U.S.C. 655(c)(3) 7
29 U.S.C. 655(d) 9, 52, 53
29 U.S.C. 655(f) 9, 30, 31, 45, 74, 75
29 U.S.C. 655(g) 7, 55
29 U.S.C. 669 83
29 U.S.C. 669(a)(3) 8
29 U.S.C. 669(a)(6) 8

Constitution, statutes and regulations—Continued — Page

29 U.S.C. 669(c) — 82
29 U.S.C. 669(e) — 8
29 U.S.C. 671(a) — 8

Service Contract Act of 1965, 41 U.S.C. 351-357 — 6
Walsh-Healey Act, 41 U.S.C. 35-45 — 6
15 U.S.C. 636 — 9, 54
29 C.F.R. 1910.1000, Table Z-2 (1977) — 10
29 C.F.R. 1910.1028 — 14
29 C.F.R. 1910.1028(a)(2)(ii) — 29, 30
29 C.F.R. 1910.1028(a)(2)(iii) — 30
29 C.F.R. 1910.1028(c) — 14
29 C.F.R. 1910.1028(c)(1) — 14
29 C.F.R. 1910.1028(c)(2) — 15, 25
29 C.F.R. 1910.1028(f) — 14
29 C.F.R. 1910.1028(h) — 15, 25
29 C.F.R. 1910.1028(i) — 14-15
29 C.F.R. 1910.1028(k) — 14
29 C.F.R. 1910.1028(j) — 15

Miscellaneous:

Comment, *Implementing the Anticancer Clauses of the Food, Drug and Cosmetic Act*, 44 U. Chi. L. Rev. 817 (1977) — 41
I *Compact Oxford English Dictionary* — 56
Doninger, *Federal Regulation of Vinyl Chloride: A Short Course in the Law and Policy of Toxic Substances Control*, 7 Ecol. L.Q. 497 (1978) — 63
EPA, *A Preliminary Report on Population Risk to Ambient Benzene Exposures* (1978) — 70
Exec. Order No. 12044, 43 Fed. 12661, 12663 (1978) — 67

Miscellaneous—Continued — Page

37 Fed. Reg. 11318 (1972) — 21, 73
39 Fed. Reg. (1974):

p. 3756 — 21, 73
p. 3758 — 21, 73
p. 35890 — 21, 73
p. 35892 — 21, 73

41 Fed. Reg. (1976):

p. 46742 — 21, 62, 73
pp. 46750-46751 — 21
p. 46751 — 62, 73

42 Fed. Reg. (1977):

p. 22516 — 11, 12
pp. 22521-22522 — 13
p. 27452 — 13, 29
p. 27453 — 13
p. 27454 — 13
pp. 27460-27461 — 13
p. 27461 — 25
p. 54148 — 21

43 Fed. Reg. (1978):

pp. 5917-5970 — 14
p. 12890 — 30
pp. 13561-13563 — 14
p. 27350 — 21, 73
p. 27360 — 57
pp. 27378-27389 — 21, 73
p. 27971 — 30
p. 45762 — 21, 73
p. 45790 — 21, 73
p. 52952 — 21, 68, 73
pp. 52960-52972 — 68
p. 52978 — 57

Miscellaneous—Continued	Page
p. 52963	21, 73
p. 53008	57
Fried, *The Value of Life*, 82 Harv. L. Rev. 1415 (1969)	62
H.R. Conf. Rep. No. 94-700, 94th Cong., 1st Sess. (1975)	57
Industrial Hygiene Field Operations Manual, Empl. Safety & Health Guide (CCH) ¶ 4483.80 (1979)	54
Interagency Liaison Group's *Report on Scientific Bases for Identifying Potential Carcinogens and Estimating Their Risks* (Feb. 6, 1979)	67
McGarity, *Substantive and Procedural Discretion in Administrative Resolution of Science Policy Questions: Regulating Carcinogens in EPA and OSHA*, 67 Geo. L.J. 729 (1979)	65
Rhoads and Singer, *What is Life Worth?*, 51 Pub. Interest 74 (Spring 1978)	62
S. 755, 96th Cong., 1st Sess. § 3 (1979)	68
Senate Comm. on Governmental Affairs, 95th Cong., 2d Sess., Study on Federal Regulation, Vol. VI (Comm. Print 1978)	62
S. Rep. No. 94-516, 94th Cong., 1st Sess. (1975)	57
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Webster's Third New International Dictionary (1971)	56

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OPINIONS BELOW

The opinion of the court of appeals (Pet. App. 1a-33a)[1] is reported at 581 F.2d 493. The regulation

[1] We use the following abbreviations in this brief. "Pet. App." refers to the separate appendix to the petition in No. 78-911. "A." refers to the Joint Appendix filed in this Court. "Tr." refers to the transcript of the rulemaking hearings

in question and the Secretary's accompanying explanation (Pet. App. 34a-252a) appear at 43 Fed. Reg. 5918-5970.

JURISDICTION

The judgment of the court of appeals (Pet. App. 254a-255a) was entered on October 5, 1978 (A. 37). The petition for a writ of certiorari in No. 78-911 was filed on December 7, 1978, and the petition in No. 78-1036 on December 26, 1978. The petitions were granted and the cases consolidated on February 21, 1979 (A. 38-39). The jurisdiction of this Court rests on 28 U.S.C. 1254(1).

QUESTIONS PRESENTED

1. Whether a health and safety standard for a toxic substance promulgated by the Secretary of Labor pursuant to 29 U.S.C. 655(b) must satisfy a cost-benefit test.

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conducted in 1977 prior to the final standard. "Exh." refers to exhibits received during the rulemaking proceeding. "Amend. Tr." refers to the transcript of the hearings in May 1977 on the amendment to the standard. (For the Court's convenience, an index to the voluminous record has been prepared by the parties and will be lodged with the Clerk.) "Leg. Hist." references are to the Subcomm. on Labor of the Senate Comm. on Labor and Public Welfare, 92d Cong., 1st Sess., Legislative History of the Occupational Safety and Health Act of 1970 (Comm. Print 1971). The Act confers the rulemaking power at issue on the Secretary of Labor, who, in turn, has delegated it to the Assistant Secretary of Labor for Occupational Safety and Health. For convenience, we shall refer to the Secretary, the Assistant Secretary, and the Occupational Safety and Health Administration as "the Secretary."

2. Whether a health and safety standard that is supported by substantial evidence based on the best available scientific knowledge may be set aside because of the possibility that future scientific studies will provide better evidence concerning the need for the standard.

STATUTE INVOLVED

Section 3(8) of the Occupational Safety and Health Act of 1970, 29 U.S.C. 652(8), provides:

> The term "occupational safety and health standard" means a standard which requires conditions, or the adoption or use of one or more practices, means, methods, operations, or processes, reasonably necessary or appropriate to provide safe or healthful employment and places of employment.

Section 6(b)(5) of the Act, 29 U.S.C. 655(b)(5), provides:

> The Secretary, in promulgating standards dealing with toxic materials or harmful physical agents under this subsection, shall set the standard which most adequately assures, to the extent feasible, on the basis of the best available evidence, that no employee will suffer material impairment of health or functional capacity even if such employee has regular exposure to the hazard dealt with by such standard for the period of his working life. Development of standards under this subsection shall be based upon research, demonstrations, experiments, and such other information as may be appropriate. In ad-

dition to the attainment of the highest degree of health and safety protection for the employee, other considerations shall be the latest available scientific data in the field, the feasibility of the standards, and experience gained under this and other health and safety laws.

STATEMENT

On February 10, 1978, the Secretary of Labor promulgated an occupational health standard restricting employee exposure to benzene. The standard (1) sets a maximum permissible exposure level (PEL) in the workplace of 1 part per million (ppm) of airborne benzene, averaged over an eight-hour period with a ceiling exposure for a 15-minute period of 5 ppm; (2) requires engineering and work practice controls as the primary means to achieve this level; and (3) where employees are exposed to liquids containing benzene, requires the use of protective equipment to prevent skin and eye contact with liquid benzene. The court of appeals set aside the first two aspects of the standard because, in the court's view, the requirements are not "reasonably necessary" to provide healthful employment within the meaning of Section 652(8). The court set aside the protective clothing requirement because it concluded that the requirement is not based on the "latest available scientific data in the field" within the meaning of Section 655(b)(5).

A. The Occupational Safety and Health Act [2]

Congress enacted the Occupational Safety and Health Act of 1970 (OSHA) "to assure so far as possible every working man and woman in the Nation safe and healthful working conditions." 29 U.S.C. 651(b). See generally *Atlas Roofing Co.* v. *OSHRC*, 430 U.S. 442, 444-445 (1977).

The Act imposes two duties on employers. One is a "general duty" to furnish employment and a place of employment "free from recognized hazards that are causing or are likely to cause death or serious physical harm * * *." 29 U.S.C. 654(a)(1). Employers also must obey "occupational safety and health standards" set by the Secretary of Labor. 29 U.S.C. 654(a)(2). These are standards "which require[] conditions, or the adoption or use of one or more practices, means, methods, operations, or processes, reasonably necessary or appropriate to provide safe or healthful employment and places of employment." 29 U.S.C. 652(8).

The Act authorizes the Secretary to issue three types of standards. During the first two years of the Act, 29 U.S.C. 655(a) permitted the Secretary to adopt as an occupational health or safety standard any preexisting "national consensus standard" or

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[2] This Court has reviewed the OSHA enforcement scheme in the light of constitutional challenges raised under the Fourth and Seventh Amendments. *Marshall* v. *Barlow's, Inc.*, 436 U.S. 307 (1978); *Atlas Roofing Co.* v. *OSHRC*, 430 U.S. 442 (1977). This case is the first occasion for the Court to consider the scope of the Secretary's statutory power to set occupational health and safety standards.

"established Federal standard." 29 U.S.C. 655(a).[3] In the event that there was more than one such standard, the Secretary was required to select the standard that assured "the greatest protection of the safety or health of the affected employees." 29 U.S.C. 655(a). Several thousand such standards are in force; they are the great bulk of OSHA standards.

The second kind of standard is the "emergency temporary standard," which the Secretary may issue to take immediate effect when he determines that employees are exposed to grave danger from toxic materials or harmful physical agents and concludes

[3] A "national consensus standard" is any occupational safety or health standard that "(1) has been adopted and promulgated by a nationally recognized standards-producing organization under procedures whereby it can be determined by the Secretary that persons interested and affected by the scope or provisions of the standard have reached substantial agreement on its adoption, (2) was formulated in a manner which afforded an opportunity for diverse views to be considered and (3) has been designated as such a standard by the Secretary, after consultation with other appropriate Federal agencies." 29 U.S.C. 652(9). The term "established Federal standard" means any "operative occupational health and safety standard established by any agency of the United States * * *." 29 U.S.C. 652(10). As a result of this provision and 29 U.S.C. 653(b)(2), a number of standards issued under other statutes—including the Walsh-Healey Act, 41 U.S.C. 35-45; the Service Contract Act of 1965, 41 U.S.C. 351-357; the Contract Work Hours and Safety Standards Act, 40 U.S.C. 327-333; the Longshoremen's and Harbor Workers' Compensation Act, 33 U.S.C. 901-950; and the National Foundation on Arts and Humanities Act, 20 U.S.C. 951-960—became occupational health and safety standards under OSHA. The standards issued under other statutes were adopted without the need for repromulgation.

that such emergency standards are necessary to protect employees. 29 U.S.C. 655(c).[4]

The third type of standard is the permanent standard. 29 U.S.C. 655(b) prescribes a rulemaking procedure for fashioning permanent standards to supersede standards previously adopted under Section 655(a) or to provide new standards where none previously existed. Section 655(b) generally permits the Secretary to set whatever standard he determines is appropriate for health or safety protection.[5] Where, however, the Secretary sets a permanent standard for toxic materials or harmful physical agents, Section 655(b)(5) requires the Secretary to

> set the standard which most adequately assures, to the extent feasible, on the basis of the best available evidence, that no employee will suffer material impairment of health or functional capacity even if such employee has regular exposure to the hazard dealt with by such standard for the period of his working life. Development

[4] Emergency temporary standards may remain effective no more than six months. 29 U.S.C. 655(c)(3).

[5] The Secretary must determine "that a rule should be promulgated in order to serve the objectives of the [Act]," 29 U.S.C. 655(b)(1), and must give "due regard to the urgency of the need for mandatory safety and health standards for particular industries" and to the "recommendations of the Secretary of Health, Education, and Welfare * * *." 29 U.S.C. 655(g). Whenever a permanent standard "differs substantially from" a national consensus standard, the Secretary must explain "why the rule as adopted will better effectuate the purposes of" the Act. 29 U.S.C. 655(b)(8).

> of standards under this subsection shall be based upon research, demonstrations, experiments, and such other information as may be appropriate. In addition to the attainment of the highest degree of health and safety protection for the employee, other considerations shall be the latest available scientific data in the field, the feasibility of the standards, and experience gained under this and other health and safety laws.

The Act establishes a National Institute for Occupational Safety and Health (NIOSH) to assist the Secretary in his tasks.[6] The standards adopted by the Secretary, including toxic-substances standards, may permit variances in certain circumstances, but economic hardship is not a ground for a variance.[7]

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[6] NIOSH is required, on the basis of research, demonstrations and experiments, to "develop criteria dealing with toxic materials and harmful physical agents and substances which will describe exposure levels that are safe for various periods of employment, including but not limited to the exposure levels at which no employee will suffer impaired health or functional capacities or diminished life expectancy as a result of his work experience." 29 U.S.C. 669(a)(3). (NIOSH performs this duty as the Secretary's delegate. 29 U.S.C. 671(a).) NIOSH is to publish annually a list of all known toxic substances by generic family or other useful grouping, and the concentrations at which such toxicity is known to occur. If a potentially toxic substance is not covered by any standard, NIOSH must so advise the Secretary. 29 U.S.C. 669(a)(6) and (e).

[7] Any employer may apply to the Secretary for a "temporary" variance where, among other things, he is unable to comply because the necessary construction or alteration of facilities cannot be completed by the effective date of the standard. 29 U.S.C. 655(b)(6)(A). An employer is entitled to a "permanent" variance if he establishes that the conditions, practices, means, methods, operations, or processes used or proposed to be used by it will provide employment and places of employment as safe and healthful as those that would prevail if it complied with the standard. 29 U.S.C. 655(d). Thus, the statute is "cost-effective" in the sense that it permits employers to meet the performance standards in any way that provides the designated level of protection. Although economic hardship may not be a ground for a temporary variance (see Leg. Hist. 1188, 1201), the Act provides for small business loans to finance the cost of compliance. 15 U.S.C. 636.

Section 655(f) authorizes pre-enforcement review of a new standard by the court of appeals at the request of any person adversely affected by the standard. Petitions for review must be filed, if at all, within 60 days after promulgation of the standard. In such proceedings "[t]he determinations of the Secretary shall be conclusive if supported by substantial evidence in the record considered as a whole." 29 U.S.C. 655(f).

B. Previous Benzene Standards

Benzene[8] has long been known to cause a number of nonmalignant blood diseases, some fatal. See pages

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[8] Benzene is a clear, colorless, noncorrosive, highly flammable hydrocarbon (C_6H_6) with a strong, rather pleasant odor. Benzene's low boiling point and high vapor pressure cause it to evaporate rapidly under ordinary atmospheric conditions (Pet. App. 69a). Benzene can be present naturally in small quantities (a few parts per billion). It is manufactured in substantial quantities for a wide variety of industrial uses (*id.* at 69a-70a). It is used as a solvent and in the manufacture of other organic chemicals, pesticides, detergents, solvents and paint removers. Industries currently using benzene include the chemical, petroleum, rubber fabricating, adhesive, varnish and paint industries (*id.* at 70a). The petrochemical and petroleum refining industries produce 94% of the total domestic production of benzene (*id.* at 69a). Recovery of

15-20, *infra*. More recently, it has been determined that benzene causes leukemia.

For many decades before benzene's carcinogenic effects were established, groups responsible for recommending levels of exposure to benzene had reduced the recommended levels again and again.[9] In 1971, shortly after the Act was passed, the Secretary adopted a preexisting national consensus standard for benzene under the authority of Section 655(a). See 29 C.F.R. 1910.1000, Table Z-2 (1977). That standard allowed an eight-hour time-weighted average (TWA) exposure of 10 ppm, with a maximum concentration of 25 ppm averaged over a 10-minute period. Concentration was not exceed 50 ppm at any time. This standard was based on benzene's known nonmalignant effects and not on any possible leukemia hazard (Pet. App. 71a; Exh. 2A-159 at 6-7).

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coal-derived benzene, primarily as a by-product of the coking process in steel mills, account for 6% of domestic production (*ibid.*). Only 11 other chemicals and one other hydrocarbon (ethylene) are produced in greater tonnage than benzene in this country (*ibid.*).

[9] See Pet. App. 71a. In 1946 the American Conference of Government Industrial Hygienists (ACGIH) recommended a threshold limit value (TLV) of 100 ppm. Its recommendation was reduced to 50 ppm in 1947. In 1948 it followed the Massachusetts Department of Occupational Hygiene in adopting a TLV of 35 ppm. In 1963 ACGIH once against reduced the recommended level, this time to 25 ppm. And in 1969 the American National Standards Institute, a voluntary standards-setting organization, adopted a TLV of 10 ppm. This reduction was based on the known hazards of benzene other than cancer. ACGIH reduced its recommended TLV to 10 ppm in 1974.

In 1974 NIOSH advised the Secretary that "the possibility that benzene can induce leukemia cannot be dismissed" (Exh. 2-3 at 75).[10] NIOSH observed, however, that the literature dealing with the effects of benzene on exposed workers consisted primarily of case history reports rather than statistically valid studies, and it concluded that there was no "conclusive" proof that exposure to benzene causes leukemia (Exh. 2-3 at 22-23, 40, 74-75). NIOSH therefore recommended no changes in the current standard's TWA of 10 ppm. On the basis of benzene's nonmalignant effects, however, NIOSH recommended that the ceiling of exposure to benzene for a 15-minute period be reduced to 25 ppm, and that increased monitoring, medical surveillance and labeling requirements be imposed (Pet. App. 72a).

Between 1974 and 1976 several epidemiological studies[11] demonstrated a statistically significant risk that workers occupationally exposed to benzene would develop leukemia. In 1976 the National Research Council reviewed the available data and concluded that benzene must be considered a carcinogen (Exh.

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[10] NIOSH's report can be found at 42 Fed. Reg. 22516 (1977).

[11] In an epidemiological investigation, scientists select a group ("cohort") of workers who have received exposure to a chemical for a number of years. They then compare the number of cancers in that group with the number of cancers in a similar group that has not been exposed to the chemical, in order to determine if exposure to that chemical is associated with the formation of cancers.

2-4 at iii).[12] In 1976 NIOSH reported to the Secretary that the accumulated clinical and epidemiological studies conclusively established that benzene causes leukemia (Exh. 2-5 at 10). NIOSH stated that it could not ascertain a "safe" level for benzene exposure (*ibid.*), and it recommended that permissible exposure be lowered to a two-hour TWA of 1 ppm in the air (Pet. App. 72a). Shortly thereafter, NIOSH "strongly recommend[ed]" that the Secretary immediately promulgate an emergency temporary standard (Pet. App. 72a; Exh. 2-6 at 1).

In January 1977 the Secretary issued voluntary "Guidelines for Control of Occupational Exposure to Benzene." These guidelines recommended that exposure not exceed 1 ppm (Pet. App. 73a; Exh. 2-44). In April 1977 NIOSH released to the Secretary the preliminary results of another study showing a risk of leukemia among workers exposed to benzene and again urged him to issue an emergency temporary standard. On May 3, 1977, the Secretary issued an emergency standard, which set a maximum exposure limit of 1 ppm. 42 Fed. Reg. 22516 (1977).[13]

[12] The National Research Council is the principal operating agency of the National Academy of Sciences, a congressionally chartered, quasi-official organization of distinguished scientists and technologists which investigates and reports upon broad scientific problems relevant to the public welfare.

[13] Several petitions for review were filed. See *Industrial Union, AFL-CIO* v. *Bingham*, No. 77-1395 (D.C. Cir.); *American Petroleum Institute* v. *OSHA*, No. 77-1516 (5th Cir.). The Fifth Circuit stayed the emergency temporary standard. No decision on the merits was issued by either court. The emergency temporary standard was never enforced.

C. The Permanent Standard

On May 27, 1977, the Secretary published a proposed permanent standard for benzene. 42 Fed. Reg. 27452 (1977). The proposed standard established an exposure limit of 1 ppm averaged over an eight-hour period, with a ceiling of 5 ppm during any 15-minute period. The proposal also required the use of gloves, masks, or other apparel to prevent eye contact with benzene and repeated or prolonged skin exposure to liquid benzene. In addition, monitoring of airborne concentrations of benzene, medical surveillance, labeling, and recordkeeping were proposed (*id.* at 22521-22522, 27454). The agency proposed to exempt work operations during the first year of the standard where the only exposure to benzene was from liquid mixtures containing 1% or less benzene. After the first year, the exception was to apply only to liquids containing 0.1% or less benzene (*id.* at 27460-27461).[14] Public comment on the proposal was invited (*id.* at 27452).

The agency received extensive comments from numerous parties, and a hearing was conducted from July 19 through August 10, 1977. Ninety-five persons appeared as witnesses to represent industries including refining, petrochemical, oil and gas production, aviation fueling, and coke ovens and coke

[14] The proposal also excluded activities related to storage, distribution, and sale of gasoline as a fuel subsequent to its discharge from bulk terminals. The agency explained that this area was the subject of an ongoing study and that it intended to assess the situation after conclusion of that study (42 Fed. Reg. 27453 (1977)).

by-products. Comments were received from representatives of other industries, such as analytical and research laboratories, paint manufacturing, construction, maritime, and rubber manufacturing. Representatives of the affected workforce, including a number of employees who had been exposed to benzene, also testified (Pet. App. 74a-75a). The record of this proceeding includes a hearing transcript of 3,500 pages and more than 1,100 comments and exhibits.

On February 10, 1978, the Secretary issued the permanent standard (Pet. App. 34a-66a).[15] The standard, codified at 29 C.F.R. 1910.1028, requires that occupational exposure to airborne benzene be reduced so that no employee is exposed to more than 1 ppm of benzene in the air, averaged over eight hours, or to more than 5 ppm of airborne benzene averaged over 15 minutes. Section 1910.1028 (c)(1). The standard requires monitoring of exposure levels and requires employers to advise employees of their exposure levels. Section 1910.1028 (c). Employers must implement engineering controls and work practices to bring exposures within permissible limits or as low as possible, and until they do so must require employees to wear respirators. Section 1910.1028(f). The standard also requires labeling of products containing benzene (Section 1910.1028(k)), medical surveillance (Section 1910.-

[15] 43 Fed. Reg. 5917-5970 (1978). Errata appear at 43 Fed. Reg. 13561-13563 (1978). The printed appendix to the petition in No. 78-911 does not contain the corrections, which we will note as necessary.

1028(i)), and employee training (Section 1910.1028 (j)). Direct skin and eye contact with liquids containing benzene is prohibited, and protective clothing must be provided to employees who are likely to be exposed to such liquids (Section 1910.1028(c)(2) and (h)).

D. The Basis for the Standard

The Secretary issued a lengthy statement of findings and conclusions based on the administrative record, explaining why he adopted the standard (Pet. App. 67a-251a).

1. *Toxic effects of benzene*

The Secretary concluded that the evidence in the record conclusively establishes that benzene causes leukemia, a cancer of the white blood cells that causes rapid death (*id.* at 98a-99a, 122a).[16] The Secretary summarized the voluminous evidence and studies linking benzene with leukemia (*id.* at 99a-132a). One study, for example, showed that workers exposed to benzene had a risk of leukemia 20 times greater than the normal population (*id.* at 100a); another study showed a risk five times greater (*id.* at 105a).[17] In-

[16] Despite the fact that half of the adults diagnosed with the subtype of leukemia (acute myelogenous leukemia or AML) most commonly associated with benzene have remissions averaging from six to eight months, the prognosis of the disease remains poor. Those who enter into remission have life expectancies of 12 to 18 months; those who do not generally die within three to six months (Pet. App. 99a).

[17] In 1977 Dr. Peter F. Infante of NIOSH reported the results of his retrospective epidemiological study of leukemia

dustry participants in the hearing did not, for the most part, challenge the conclusion that benzene causes leukemia (Pet. App. 123a). They argued, however, that a threshold existed below which exposure to benzene was safe and that 10 ppm, the

among benzene-exposed workers employed at Goodyear's Akron and St. Mary's plants between 1940 and 1949 (Exhs. 2-51, 2A-271). Causes of death among these workers were determined from death certificates. Dr. Infante and his colleagues reported that this study showed a statistically significant five-fold increased risk of dying of leukemia, and a 10-fold increased risk of dying of the type of leukemia (AML) most commonly associated with benzene, when compared to two control groups.

Dr. Infante made several assumptions that tend to underestimate the cancer risk. First, the status of a number of employees could not be determined. They were assumed to be alive. Second, Dr. Infante relied on death certificates to determine the cause of death; these tend to understate the incidence of leukemia. Third, Dr. Infante excluded deaths before 1950. Some victims may have died in the period 1940-1949 (see Exh. 2-51).

Dr. Marvin Sakol, a hematologist, testified that he had observed nine leukemia cases among the workers studied by Dr. Infante, almost twice the number reported in the Infante study (Tr. 286-289, 307, 308-315; Exh. 61). He also observed 12 new leukemia cases between 1960 and 1973; at least five of these had worked at the plant studied by Dr. Infante (Tr. 315-316). He testified that during the 1950s, when workers' compensation programs did not recognize leukemia as a compensable employment-related disease, physicians would sign death certificates stating that the cause of death was aplastic anemia, rather than a diagnosed leukemia, so the family would receive compensation (Tr. 311). Dr. Sakol also testified that the use of death certificates to find the causes of death leads to underestimation of the number of cases because the immediate cause of death of leukemia patients was often a resulting complication of the disease, such as a heart attack (Tr. 307-308).

existing standard, was within the safe range (*id.* at 123a-124a). This argument was based chiefly on "negative" epidemiological studies of certain groups of employees, exposed to low levels of benzene, who did not contract leukemia. The thresholds were said to lie between the exposure levels of these studies and the higher exposure levels at which cancers have been shown to occur.

Although the issue whether thresholds exist is argued "in a manner similar to those arguing religion" (Exh. 217.32.H.16 at 1), the majority of the cancer specialists at the hearing testified that there are no data reliably establishing that a safe level exists for benzene.[18] The Secretary concluded that no threshold for benzene could be found because (i) given difficulties in methods, negative studies are generally less informative than positive ones (see Pet. App. 123a-124a), and the specific negative studies presented by the industrial parties, each of which the

[18] See the testimony of Dr. Robert N. Ligo of NIOSH (Tr. 1225; Dr. Herman F. Kraybill of the National Cancer Institute (Tr. 775-778, 1178-1180, 1210); Dr. Charles Shaw of NIOSH (Tr. 401-402); Dr. Peter Infante of NIOSH (Tr. 1066); Dr. John A. Zapp, Jr., testifying for the Manufacturing Chemists Association (MCA) (Exh. 149-D at 15); Dr. Bernard Goldstein of the New York University Medical Center (Tr. 352); Dr. Leonard J. Goldwater, testifying for the MCA (Tr. 2500, 2520-2521); Dr. William R. Gaffey, testifying for respondent American Petroleum Institute (Tr. 1372). This testimony was consistent with the 1970 report of the National Cancer Institute's (NCI's) Ad Hoc Committee on the Evaluation of Low Levels of Environmental Carcinogens, which states: "for carcinogenic agents a 'safe level for man' cannot be established by application of our present knowledge" (Exh. 2.B.272 at 1). NCI reaffirmed this view at the rulemaking hearing (Tr. 1178-1179).

Secretary discussed, are defective;[19] (ii) the available data concerning workers exposed to benzene do not show the levels of exposure, and it is therefore impossible to construct a risk-assessment (or dose-response) curve that would plot the risk of cancer as a function of the degree of exposure;[20] and (iii) the biological mechanism by which benzene causes leukemia is not known (Tr. 363; Exh. 217.32.H.26 at 25).

The existence of a risk of cancer even at levels of exposure lower than 10 ppm also was supported by the three affirmative considerations. First, many physicians subscribe to the theory that "all it takes to start the carcinogenic process is to have one molecule of the carcinogen hit the proper site that they now have identified as DNA in the nucleus of the susceptible organ site" (Exh. 97 at 55). If this theory is correct, there is an ever-present risk of cancer at any exposure, although the risk decreases as the exposure level decreases and increases with the duration of the exposure. Second, there is known to be great variation in the degree of susceptibility of persons to benzene's leukemogenic effects, suggesting that the biological mechanism by which benzene causes cancer is influenced by age, prior medical problems, genetic factors, exposure to other carcinogens, and other variables (Pet. App. 117a-118a). Thus, even if certain employees would be safe at certain levels of exposure, other employees might not be safe. The more susceptible employees cannot be identified in advance of exposure (*id.* at 184a). Third, even if a high level of exposure is necessary to induce leukemia where the duration of exposure is short, repeated or continual exposures to low concentrations may be equally sufficient to cause leukemia (Pet. App. 116a-117a; Tr. 420, 3209).[21]

The Secretary also concluded that benzene causes nonmalignant blood diseases, some fatal, for which no level of safety was known (Pet. App. 96a-98a),[22]

[19] For example, some of the studies did not separate workers who were exposed to benzene from those who were not in computing the study population's risk of leukemia. Others failed to perform follow-up investigations of workers once they had left the plant, thereby excluding two groups who regularly have a statistically higher incidence of disease than active workers—retirees and people who terminate employment early. Still others failed to indicate information necessary to permit any evaluation of their validity, such as how the study population was chosen and how long workers had been exposed to benzene (see Pet. App. 107a-112a).

[20] See pages 62-69, *infra*.

[21] The mathematical techniques that have been suggested for computing thresholds give extraordinarily low figures. For example, Dr. Leonard J. Goldwater calculated that the threshold for vinyl chloride is .03 parts per billion (Tr. 2524-2526). Similarly, Dr. Herman F. Kraybill testified that scientists are generally suggesting that "10^3 molecules, 10^6 or 10^9" could induce cancer (Tr. 1179). An employee exposed at 1 ppm would inhale far more than 10^9 molecules of benzene in an hour. (The Secretary, however, believes that these techniques do not yield reliable estimates of the risk of cancer.)

[22] Benzene reduces the number of red blood cells, white blood cells and platelets (*id.* at 82a). A decline of all three is known as aplastic anemia, which may be fatal (*id.* at 82a-84a). Decline in the number of red blood cells leads to anemia which, if chronic, may lead to exacerbation of coronary insufficiencies or other heart conditions (*ibid.*). A decline in the number of white blood cells reduces the natural immunity of the body

and caused chromosomal damage.[23] These hazards, he concluded, independently called for reductions in exposure (*id.* at 97a-98a).

2. *The policy of the lowest feasible level of exposure*

Had the Secretary found a safe and achievable level of exposure to benzene, he would have set the standard at that level (Pet. App. 183a-190a). Having found no safe level of exposure to benzene, the Secretary was required to decide how stringent the standard should be. He considered two kinds of approach to this task.

One body of public health opinion holds that, where a safe level of exposure to a carcinogen is not known, exposure should be kept at zero or, if that is not

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from disease (*ibid.*). Loss of platelets impairs clotting and may lead to hemorrhages (*id.* at 82a-83a). Some nonmalignant blood disorders of employees exposed to benzene have been fatal (*id.* at 89a). The record shows instances of blood abnormalities from exposure in the 25-40 ppm range and aplastic anemia from exposures as low as 5-10 ppm (*id.* at 89a; Exhs. 154 (Ott Study), 159A, 2B-304). Dermal contact with liquid benzene may cause erythema, blistering, dermatitis and secondary dermal infections (Pet. App. 80a).

[23] See Pet. App. 126a-132a. Several studies show chromosomal damages below 25 ppm, perhaps as low as 10 ppm (*id.* at 128a; Exh. 5B at 3-3). It has been suggested that the chromosomal damage is associated with leukemia or may result in genetic mutations (Exhs. 2-94, 2-102, 132). It is not now possible to determine conclusively what these chromosomal aberrations mean in terms of demonstrable health effects. The Secretary noted, however, that "chromosomal damage represents an adverse biological event of serious concern which may pose or reflect a potential health risk and as such, must be considered in the larger purview of adverse health effects associated with benzene" (Pet. App. 132a).

possible, at the lowest feasible level (Pet. App. 183a-190a). Considerable medical and public health opinion supports this policy (Tr. 148-149, 328, 351, 1229, 1999-2000; Exhs. 2.B.272 at 1-2, 2-5 at 10). In view of the command of 29 U.S.C. 655(b)(5) that the Secretary adopt "the" standard that "most adequately assures, to the extent feasible" that "no" employee will suffer material health impairment even if he is exposed for his entire working life, the Secretary adopted this approach, as he has in promulgating numerous other OSHA standards for carcinogens.[24] The Secretary found that the lowest feasible level is 1 ppm (Pet. App. 187a).[25]

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[24] In setting standards for carcinogens and other toxic materials for which no known safe level of exposure can be found, the Secretary has consistently adopted the lowest feasible level and expressly declined to implement a cost-benefit approach. See 37 Fed. Reg. 11318 (1972) (asbestos dust); 39 Fed. Reg. 3756, 3758 (1974) (14 substances); 39 Fed. Reg. 35890, 35892 (1974) (vinyl chloride); 41 Fed. Reg. 46742, 46750-46751 (1976) (coke oven emissions); 43 Fed. Reg. 27360, 27378-27379 (1978) (cotton dust); 43 Fed. Reg. 52952, 52963 (1978) (lead dust); 43 Fed. Reg. 45762, 45790 (1978) (acrylonitrile).

The Secretary also has published a proposed regulation that would permit him to establish categories of toxic substances. See 42 Fed. Reg. 54148 (1977) (Identification, Classification and Regulation of Toxic Substances Posing a Potential Carcinogenic Risk).

[25] The Secretary also found that prudent public health policy would lead to the 1 ppm level without regard to benzene's causation of leukemia. After observing that benzene was known to cause blood diseases at exposures less than 100 ppm, the Secretary observed (*id.* at 97a-98a):

> It is customary to use a safety factor of 10-100 or greater depending on the seriousness of the toxic effects and the

Industry witnesses suggested a different approach (see A. 40-58, 77-94, 135-148, 158-179). They contended that the degree of health protection should be determined through a cost-benefit technique, which would measure as closely as possible the number of lives that would be saved at progressively lower levels of exposure. Under this approach the Secretary would set the level of exposure at the point where the additional lives saved by further reduction are not worth the additional cost to save them (Pet. App. 160a-161a). Whether the cost is worthwhile would be determined by comparing the estimate of the number of lives that would be saved by the new standard with the number of lives (and other health or environmental benefits) that might be achieved by requiring industry to apply the same funds to meet other environmental or health standards. At a minimum, industry argued, workers ought to be willing to tolerate health risks comparable to those government has, in other contexts, implicitly found to be "acceptable."

The Council on Wage and Price Stability, in a somewhat similar fashion, urged OSHA to investigate the incremental costs and benefits of alternative standards "to determine whether a proposed standard should be made even more stringent or perhaps re-

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nature of the data being relied upon. That is, the lowest levels at which effects had been observed would be reduced by the safety factor chosen in establishing the exposure limit. Taking this approach in the case of benzene would lead to a permissible exposure substantially less than 10 ppm without regard to the issue of leukemia and the view that no safe level can be established for the carcinogenic risk.

laxed in some circumstances" (A. 131). The Council concluded that, although the procedures it suggested to estimate the health impact of alternative benzene standards would not "yield an accurate calculation of incremental benefits, they would provide a range of health benefit estimates that should be included in an economic analysis in order to aid OSHA in setting the final standard" (A. 130).

The Secretary explained his decision not to adopt these approaches on two grounds. First, the Secretary concluded that the lack of data made it impossible to quantify the health risk at various levels of exposure, and prudent public health policy required that exposure to a known carcinogen be reduced as much as possible until such time as it can be shown that a safe threshold of exposure exists (*id.* at 160a). Second, even if data were available to quantify the risk, Section 655(b)(5) requires the adoption of the standard which assures maximum benefit (*i.e.*, prevention of serious illness or death), constrained only by the limits of feasibility (Pet. App. 162a):

> In making judgments about specific hazards, OSHA is given discretion which is essentially legislative in nature. However, in setting an exposure limit for a substance like benzene, OSHA may not substitute cost benefit criteria for the legislatively determined directive of protecting all exposed employees against material impairment of health or bodily function. Where the health effectiveness of the alternative approaches are extremely uncertain and likely to vary from situation to situation, OSHA must adopt the compliance strategy which provides

the greatest certainty of worker protection even if that approach carries with it greater economic burdens for the affected employers. In the case of the benzene standard, the evidence in the record indicates that the costs of compliance are not overly burdensome to industry.[26]

[26] Although the Secretary disclaimed any obligation to quantify the health benefits and standards, in response to the contention that standards should be set by weighing health benefits against costs the Secretary stated (Pet. App. 160a):

> There is general agreement that benzene exposure causes leukemia as well as other fatal diseases of the bloodforming organs. In spite of the certainty of this conclusion, there does not exist an adequate scientific basis for establishing the quantitative dose response relationship between exposure to benzene and the induction of leukemia and other blood diseases. The uncertainty in both the actual magnitude of expected deaths and in the theory of extrapolation from existing data to the OSHA exposure levels places the estimation of benefits on "the frontiers of scientific knowledge." While the actual estimation of the number of cancers to be prevented is highly uncertain, the evidence indicates that the number may be appreciable. There is general agreement that even in the absence of the ability to establish a "threshold" or "safe" level for benzene and other carcinogens, a dose response relationship is likely to exist; that is, exposure to higher doses carries with it a higher risk of cancer, and conversely, exposure to lower levels is accompanied by a reduced risk, even though a precise quantitative relationship cannot be established. In light of the uncertainties in this area of scientific knowledge, OSHA believes that it is required by prudence and by the statutory mandate to adopt a highly protective posture in considering the evidence for health benefits.

The Secretary found that 629,000 employees are affected by the benzene standard and that at least 30,000 employees are exposed now to levels between 1 ppm and 10 ppm (see Pet. App. 141a-155a).

3. *Feasibility*

The Secretary recognized that standards set under Section 655(b)(5) must be "feasible" (Pet. App. 132a-133a). To assess the economic feasibility of the proposed standard, the agency commissioned Arthur D. Little, Inc., to study the economic effect of the proposed standard on the affected industries. The Secretary thoroughly reviewed the Little study (*id.* at 134a-158a).

The Little study considered compliance costs with respect to each of 20 affected industries (Pet. App. 142a-153a). It concluded that the aggregate first-year operating costs would be in the range of $187 million to $205 million. Recurring annual costs thereafter were estimated at approximately $34 million. One-time investment in engineering controls was estimated at approximately $266 million (*id.* at 134a). After comparing these costs with information on the profitability and capitalization of the affected industries, the Secretary concluded that there is no "serious question concerning the economic feasibility of the standard or the ability of the regulated industries to bear the additional costs" and that the compliance costs are "well within the financial capability of the covered industries" (*id.* at 135a, 163a).

4. *Protective clothing*

The proposed and final standard prohibited all eye and skin contact with certain liquids containing benzene and required protective clothing where employees may have repeated eye or skin contact with such liquids (Section 1910.1028(h), 42 Fed. Reg. 27461 (1977); Section 1910.1028(c)(2), and (h), Pet. App.

36a, 42a). This requirement is based on the Secretary's policy, consistent with recognized industrial hygiene practice, that "in dealing with a carcinogen, all potential routes of exposure (i.e. inhalation, ingestion, and skin absorption) be limited to the extent feasible" (*id.* at 192a).

During the hearings, Dr. Howard Maibach testified on behalf of respondent American Petroleum Institute (Tr. 2459; A. 58) that, although he had no personal information about whether benzene may be absorbed through the skin, the extent of absorption (including the effect on absorption of temperature, solution strength, repeated application, *etc.*) could be resolved conclusively by conducting tests on animals using Carbon-14 (Tr. 2459-2490; A. 58-77, 149-157).[27] "[W]ith modern analytic and biological technology," he stated, "it should be very simple, very quickly, and inexpensively to answer this" (Tr. 2467; A. 63). He stated that the tests could be conducted in six to twelve weeks (Tr. 2487; A. 75) and at one point testified that "in the six weeks necessary to do these experiments, you will have your answer" (Tr. 2488; A. 76). Dr. Maibach did not say that he was conducting such tests or that he intended to do so. Although the hearing record was held open until September 2, 1977, neither Dr. Maibach nor anyone else submitted the results of any such experiment.

[27] The test involves applying radioactive benzene solution to animal skin and later measuring the amount of radioactive benzene in the animal's feces and urine to determine how much of the benzene had penetrated the skin.

The Secretary concluded that five considerations supported the view that dermal contact should be prohibited. First, "the view is generally accepted that [benzene] has the ability to be absorbed through the skin * * *" (Exh. 2-69 at 1; A. 107, 119-120; Tr. 860; A. 40; see Pet. App. 193a).[28] Physicians believe that benzene is absorbed because benzene is a powerful lipid solvent—a characteristic which indicates it can break through the protective cutaneous barrier (Exh. 2: A-187 at 11). Experiments show skin absorption of benzene in animals (Exhs. 2-31 at 12, 2-46 at 1-2; A. 95-96; Exh. 2-69 at 1-2; A. 107-108) and in humans (Exh. 2-69; A. 119-120).[29]

Second, even if benzene were not absorbed through intact skin, it may be absorbed through damaged skin (Pet. App. 193a). As Dr. Maibach testified, scientific experts "ordinarily assumed that penetration of any molecule will be greater through damaged skin than undamaged skin" (Tr. 2469-2470; A. 64-65). Benzene itself can damage the outermost protective cutaneous layer (see Exhs. 2-3 at 5, 53; 2-48;

[28] See also Exhs. 2-31 at 12; 2-48; 2:A.187 at 11.

[29] The Secretary did not consider these studies to be definitive, either because of their lack of control data or because of their failure to consider factors that the scientific community has found to be relevant to the permeability of human skin (Pet. App. 193a; see Tr. 2463-2464; A. 60-61). On the other hand, studies indicating that benzene is not absorbed in humans (Exhs. 2-46, 2-47; A. 95-106; Tr. 2462-2463; A. 59-60) were not considered sufficient because they are based on analysis of the sulfate ratio in the subjects' urine, a factor too insensitive and non-specific for useful application (Exhs. 2-69 at 3; A. 109; 2:A-112 at 3; Tr. 2462-2463; A. 59-60).

2:A-111 at 9; 2:A-112 at 2; 2:A-187 at 6, 11), thus increasing the likelihood of absorption.

Third, benzene often is added to or present as a contaminant in industrial solvents containing other chemically-related substances. See Exh. 5A at 4-19, 4-27 to 4-28, 4-31 to 4-32. Some of these chemically-related substances, such as xylene and toluene, are readily absorbed through the skin (see Exh. 2-3 at 25). Such substances can act as "vehicles" or carriers, which result in or increase the extent of skin absorption of benzene (Pet. App. 194a).

Fourth, it is difficult to imagine a situation where dermal contact with benzene will not also result in airborne exposure to the vapors from that liquid. Thus, whatever exposure occurs via skin absorption simply adds to that from inhalation. It is therefore advisable to guard against dermal contact in order to prevent exposure in excess of the permissible safe exposure level set for ambient concentrations (Pet. App. 194a).

Finally, apart from the question of absorption, direct contact with liquids containing benzene can cause erythema and blistering (Pet. App. 80a). Prolonged or repeated skin contact with liquids containing benzene has been associated with the development of a dry, scaly dermatitis, and with secondary dermal infections (*ibid.*).

5. *The percentage exclusion*

The proposed standard exempted "work operations where the only exposure to benzene is from liquid

mixtures containing 1% (0.1% after one year from the effective date of this standard) or less of benzene by volume, or the vapors released from these liquids." Section 1910.1028(a)(2)(ii), 42 Fed. Reg. 27460 (1977). The exemption would have applied both to inhalation and to personal contact with liquids. The original announcement called for public comment on this proposed exclusion and suggested that the final standard might not contain any such exclusion.[30]

The standard promulgated on February 3, 1978, had no percentage exclusion. In response to contentions by industry that the standard was not technologically feasible without a percentage exclusion, and well after the petitions for review of the unamended standard were filed, the Secretary announced on March 28, 1978, proposed rulemaking to amend

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[30] The announcement stated (42 Fed. Reg. 27452 (1977)):

> One of the major issues involved in this proceeding is whether the final standard should exempt certain specified operations from its coverage. For the purpose of raising this issue, the proposal, as drafted, does not cover * * * operations in which the only exposure to benzene is from liquid mixtures which contain no more than 0.1% benzene (1% benzene during the first year after the effective date of the standard). The question of whether these types of operations should be exempted is raised herein, and some of the reasons for the suggested exclusion of these operations are set out below. If these operations are excluded from the final standard issued as a result of this rulemaking, they would still be covered by the existing benzene standard in § 1910.-1000. OSHA seeks public comment and evidence on these issues.

the standard to exclude certain liquids containing benzene. 43 Fed. Reg. 12890 (1978).

On May 27 and 28, 1978, the Secretary conducted hearings on the proposed percentage-exclusion amendment. During the hearing, counsel for respondent Rubber Manufacturers Association requested a 180-day stay of the standard, which had already been issued, while Dr. Maibach conducted tests on skin absorption (Amend. Tr. 15-23; A. 181-187). The Secretary replied that he would consider such a study but that he would not delay the standard while the study was being conducted (Amend. Tr. 20-21; A. 185-186).

On June 21, 1978, the Secretary announced a percentage exclusion almost identical to the one originally proposed. 43 Fed. Reg. 27971 (1978); A. 239-275.[31]

E. The Decision of the Court of Appeals

On petitions for review under 29 U.S.C. 655(f), the court of appeals set aside the standard.[32] The

[31] The original proposal would have exempted work operations where the only exposure is from liquids containing 1% or less benzene during the first year and 0.1% thereafter. Section 1910.1028(a)(2)(ii), 42 Fed. Reg. 27460 (1977). The final amended standard exempted work operations where the only exposure is from liquids containing 0.5% or less benzene by volume during the first *three* years of the standard and 0.1% thereafter. Section 1910.1028(a)(2)(iii); A. 275.

[32] The initial petition for review was filed in the Fifth Circuit by respondent American Petroleum Institute. Petitions subsequently filed in other circuits were transferred to the Fifth Circuit and consolidated for review (see A. 1-11). Other parties intervened in the Fifth Circuit.

The first petition for review was filed on February 2, 1978, well before the amendments to the standard had been promulgated (A. 12-13). The amendment was issued the day before oral argument. The court of appeals called for supplemental briefing on the effect of the amendment. It concluded that it did not need to review the amendment and reserved the question of its feasibility. Petitions for review of the amendment are still pending in the court of appeals. Because the alterations of the standard ultimately did not affect the court of appeals' disposition of the case, it is unnecessary to review the propriety of this procedure. Compare *Tagg Bros. & Moorhead* v. *United States*, 280 U.S. 420, 444-445 (1930), with *H & H Tire Co.* v. *United States Department of Transportation*, 471 F.2d 350, 353 n.10 (7th Cir. 1972).

court began by observing that Section 655(f) explicitly prescribes the standard of review: "The determinations of the Secretary shall be conclusive if supported by substantial evidence in the record considered as a whole." The court observed that there are both factual and policy determinations in rulemaking. Section 655(f) subjects factual determinations to the substantial evidence test (Pet. App. 5a). With respect to policy determinations by the Secretary, the court concluded, it need only determine whether "the Secretary exercised his decisionmaking power within the limits imposed by Congress" (*ibid.*).

Applying this standard, the court of appeals held that substantial evidence supports the Secretary's factual findings that (a) benzene causes cancer (Pet. App. 17a-18a); (b) benzene causes diseases, some fatal, other than cancer (*id.* at 7a); (c) exposure at the 10 ppm level poses a risk of leukemia (*id.* at 18a) and reduction of the level to 1 ppm would result in health benefits (*ibid.*). The court did not dis-

pute the Secretary's finding that the standard is economically and technologically feasible. The court acknowledged that it is not now possible to determine the relationship between exposure and risk (*id.* at 19a n.23).

The court nevertheless set aside the standard. It concluded that the Secretary must ascertain the number of lives (and other health benefits) that the standard will save and determine whether their value bears a "reasonable relationship" to the cost of implementing the standard (Pet. App. 19a-20a).[33] The court found this requirement in the Act's definition of an occupational health and safety standard, 29 U.S.C. 652(8), which defines such a standard to be one "which requires conditions, or the adoption or use of one or more practices, means, methods, operations, or processes, *reasonably necessary or appropate* to provide safe or healthful employment" (emphasis added). The court stated that this provision is analogous to a statutory requirement in the Consumer Product Safety Act that prohibits any consumer product safety rule unless the Consumer Product Safety Commission finds that the rule is "reasonably necessary to eliminate or reduce an unreasonable risk of injury associated with such

[33] The court of appeals stated that it did not require an "elaborate" cost-benefit analysis (Pet. App. 17a). Nonetheless, it did require the Secretary (1) to approximate the number of lives that the standard will save, and (2) to balance these benefits against the cost of the standard in determining the level of protection to accord employees (*id.* at 19a-22a). For convenience, we refer to these two requirements as a cost-benefit test.

product." 15 U.S.C. 2058(c)(2)(A). Having held in *Aqua Slide 'N' Dive Corp.* v. *CPSC*, 569 F.2d 831, 842 (5th Cir. 1978), that the latter provision requires the agency to find that the benefits of its rule bear a reasonable relationship to the costs, the court "decline[d] to construe the precisely similar requirements of these two acts differently or to read words out of the OSHA legislation" (Pet. App. 14a-15a).

To the Secretary's argument that 29 U.S.C. 655(b)(5) calls for the "highest degree of health and safety protection" and requires the selection of the standard that "most adequately assures, to the extent feasible" that no employee will suffer material impairment of health even if he is exposed for his entire working career, the court responded that the Secretary is not given "unbridled discretion" to create "absolutely risk-free workplaces regardless of cost" (Pet. App. 15a). The statute limits the Secretary to "feasible" standards based on "the best available evidence." These provisions suggested to the court "pragmatic limitations" on the Secretary's decisions (*id.* at 16a). In any event, the court thought, in view of the parallel purposes of OSHA and the Consumer Product Safety Act it must be "guided by *Aqua Slide*" in determining whether the Secretary had chosen properly (*ibid.*).

The court held that the Secretary passed the "costs" part of its test by relying on the Little study to show that the cost of compliance was feasible (Pet. App. 17a). But the court stated that the Sec-

retary failed the "benefits" part of the test because he could not show that "measurable" benefits would result (*id.* at 18a). The court conceded that there is "general agreement in the scientific community that exposure to carcinogens at low levels is safer than exposure at higher levels" and that it is rational to conclude that a reduction in the limit from 10 to 1 ppm would result in "some benefit" (*ibid.*). As rational as this deduction might be, however, "mere rationality" was not sufficient. The Secretary must show "measurable benefits" (*ibid.*).[34]

The court acknowledged that the Secretary is unable to satisfy this requirement because the lack of data concerning the effects of exposure at low levels makes an estimate of benefits "impossible" (Pet. App. 19a n.23). Nonetheless, it concluded that the standard could not be upheld because "Congress provided that OSHA regulate on the basis of knowledge rather than on the unknown" (*id.* at 20a). The court speculated that the necessary data could be obtained in the future (*id.* at 19a n.23, 20a). (This speculation was based on three items of evidence that we discuss at note 56, *infra.*)

[34] Although disclaiming any obligation to satisfy a cost-benefit test, the Secretary argued that the standard would satisfy such a test because the standard is within the financial capability of the industry, because exposure to benzene is unsafe at any level, and because exposures to lower levels would be safer than exposures at higher levels. Conceding that "some" health benefits would result from the lower standard, the court nonetheless rejected this argument, holding that "some" benefits did not satisfy its test, which requires benefits to be quantified (Pet. App. 18a-19a).

The court also set aside the prohibition of dermal and eye contact with liquids containing benzene. The court held that the Secretary's finding that dermal contact poses risk of cancer would "pass muster" when viewed under the traditional substantial-evidence test (Pet. App. 25a). The court held, nonetheless, that the Secretary was obliged to "acquire" the radioactive benzene test recommended by Dr. Maibach before promulgating any standard based on skin absorption (*id.* at 26a-27a). No such experiment had been conducted before the Secretary promulgated his standard, but Dr. Maibach's testimony led the court to believe that definitive results could be made "readily available." The court held that the Secretary had therefore violated Section 655(b)(5)'s requirement to set standards based on "research, demonstrations, experiments, and such other information as may be appropriate," and on the "latest available scientific data in the field."

Because all of the standard's other requirements were "tied to" the permissible exposure limit and the dermal contact prohibition, the court set aside the entire standard (Pet. App. 33a).

SUMMARY OF ARGUMENT

I

The court of appeals has required the Secretary of Labor to show that the costs of regulating toxic substances under the Occupational Safety and Health Act are commensurate with the benefits of the regu-

lation. Although cost-benefit analysis may be a useful tool in ordinary cases of regulation, OSHA is no ordinary statute, and 29 U.S.C. 655(b)(5), the toxic substances provision, is no ordinary command. Section 655(b)(5) instructs the Secretary to ensure that "no employee will suffer impairment of health or functional capacity even if such employee has regular exposure to the hazard dealt with by such standard for the period of his working life." The Secretary "shall" set "the" standard necessary to achieve the level of exposure that "most adequately assures, to the extent feasible," that the no-material-impairment criterion is met. It recapitulates its purpose as "the attainment of the highest degree of health and safety protection for the employee * * *." The statute simply leaves no room for the conclusion that the Secretary must balance costs against benefits in setting an exposure level.

The court of appeals found its cost-benefit requirement in 29 U.S.C. 652(8), which defines a health and safety standard as a rule regulating practices and conditions of employment "reasonably necessary or appropriate to provide safe or healthful employment." But a cost-benefit standard can be placed in this definitional clause only by main force. The legislative history of the entire Act contains not one mention of a cost-benefit study requirement, and there is no hint that Section 652(8) was intended to modify the substantive requirements of 29 U.S.C.

655(b)(5). Under the statutory scheme, an occupational health and safety standard is "reasonably necessary or appropriate" if it carries out the goals identified in the substantive parts of the statute. The benzene standard does so, and it therefore meets the statutory requirements. Here, as elsewhere in the law, the phrase "reasonably necessary" is a description rather than a limit. See, *e.g.*, *United States* v. *An Article of Drug * * * Bacto-Unidisk*, 394 U.S. 784, 786 n.2, 791-792 (1969); *Mourning* v. *Family Publications Service, Inc.*, 411 U.S. 356, 369 (1973).

The toxic substances provision itself requires the Secretary to achieve the lowest possible risk within the range of feasibility. The language, which is quoted above, shows that a more particular cost-benefit balance is unnecessary. The legislative history shows that Congress meant what it said. The principal concern of the draftsmen of the Act was toxic substances. The statutory language was attacked repeatedly as unyielding; the supporters of the statute did not reject this analysis but embraced it as a description of their purpose. When a compromise finally was struck, Congress decided to restrict the scope of Section 655(b)(5) to toxic or hazardous substances —rather than, as originally proposed, all industrial hazards—but to leave the force of the section unchanged. The nature of the compromise is readily understood: proponents of regulation obtained a sweeping statute concerning toxic substances, while opponents confined the strongest section of the statute to this particular hazard.

The word "feasible," although introducing cost considerations into the Secretary's decisions, does not permit a cost-benefit test to be employed in setting toxic substances standards. No one suggested in the legislative debates that "feasible" has any meaning other than its usual one: "capable of being achieved." No Member of Congress suggested that a standard is not "feasible" if, although achievable, it is too costly in relation to its benefits. The absence of such a suggestion is telling. Any construction of the statute that introduces a cost-benefit balance through the "feasibility" provision would render meaningless the non-material-impairment criterion of Section 655(b)(5). There is simply no reason to conclude that Congress drafted an internally contradictory statute.

The Fifth Circuit's approach is at war with Section 655(b)(5) in yet another way. Section 655(b)(5) requires the Secretary, in issuing standards for toxic materials, to act on "the best available evidence." This provision was inserted because Congress was aware of the "frightening gap" between "our knowledge about [toxic] substances, and what we need to know" (Leg. Hist. 1044-1045). Congress therefore authorized the Secretary to act on the basis of the "best available evidence" because "it [was] not intended that the Secretary be paralyzed by debate surrounding diverse medical opinions." *Id.* at 848. The Fifth Circuit's cost-benefit rule creates precisely the type of paralysis that Congress intended to avoid. In the present case, the best available evidence for benzene is simply inadequate to perform the type of risk assessment and cost-benefit analysis

desired by the Fifth Circuit. In the Secretary's view, he will be unable to issue any benzene standard that satisfies the court's test. Congress could not have intended to establish a cost-benefit requirement that could not be met on the basis of the best available evidence.

II

The court of appeals also erred in vacating the protective clothing requirement. The court held that the Secretary should not have established this provision without first "acquiring" the results of a series of tests using radioactive benzene suggested by Dr. Howard Maibach. But the Secretary's decision to include this provision without first acquiring the radioactive-benzene studies did not violate the requirement of 29 U.S.C. 655(b)(5) that the standard be based on the "best available evidence" or the requirement that it be based on "research, demonstrations, experiments, and such other information as may be appropriate." The protective clothing requirement was based on "research, experiments, and demonstrations." It also was based on the best evidence "available." Dr. Maibach's study was then not "available." Nor is it available today, except for "preliminary results." The predictions by him and industry counsel that studies with conclusive results could be performed in only six to twelve weeks proved unfounded. By requiring the Secretary to postpone the standard until allegedly "readily" available studies are conducted, the court of appeals again has

introduced the type of paralysis that Congress sought to avoid.

ARGUMENT

I

THE OCCUPATIONAL SAFETY AND HEALTH ACT DOES NOT REQUIRE THE SECRETARY TO ESTABLISH THAT THE COSTS OF PARTICULAR REDUCTIONS IN EXPOSURE TO TOXIC SUBSTANCES ARE JUSTIFIED BY QUANTIFIABLE BENEFITS

The court of appeals held that the Occupational Safety and Health Act conditions the Secretary's ability to order reductions in exposure to toxic substances on his ability to show that the benefit to the workers' health bears some quantifiable relationship to the costs of the regulation. The court conceded that no such requirement can be found in 29 U.S.C. 655(b)(5), which authorizes and sets the criteria for toxic substances regulations. The court found its requirement, instead, in a definitional provision of the Act that speaks of standards "reasonably necessary or appropriate" for public health. 29 U.S.C. 652(8). In the court's view, a cost-benefit rule is reasonable public health policy, and thus to be read into the Act through the definitional section. The court of appeals thought that it makes simple good sense to require the agency to determine that the benefits of its regulations are worthwhile when measured against the costs.

But the court of appeals was not at liberty to insist that the Secretary of Labor follow its approach in dealing with toxic substances. Although many statutes permit or require the kind of cost-benefit assessment that the court of appeals thought to be desirable, other statutes do not. See, *e.g.*, *Union Electric Co.* v. *EPA*, 427 U.S. 246 (1976) (the Clean Air Act contains no requirement that state implementation plans for air pollution be economically or technologically feasible, much less cost-beneficial); Comment, *Implementing the Anticancer Clauses of the Food, Drug and Cosmetic Act*, 44 U. Chi. L. Rev. 817 (1977) (discussing several statutes that regulate use of carcinogens without regard to cost). When a statute requires regulation in the name of safety without regard to the balance between costs and benefits, or even feasibility, neither the Executive Branch nor a court may require such a balance to be struck. *TVA* v. *Hill*, 437 U.S. 153, 193-195 (1978).

The toxic-substances provision of the Act does not go quite that far. 29 U.S.C. 655(b)(5) states that the Secretary "shall" set "the" standard that "most adequately assures, to the extent feasible" that "no employee will suffer material impairment of health or functional capacity even if such employee has regular exposure to the hazard dealt with by such standard for the period of his working life." The section then recapitulates its goal as "the attainment of the highest degree of health and safety protection for the employee * * *." A statute written in such terms is an unmistakable instruction from Congress

that employee health is to be achieved even at great cost.[35] The policy of Congress is that cost may be considered only to determine what is "feasible." In the pages that follow, we show that neither the definitional provision of 29 U.S.C. 652(8) nor the "feasibility" language of Section 655(b)(5) requires the Secretary to engage in the sort of cost-benefit balancing proposed by the court of appeals.

A. The Definitional Phrase "Reasonably Necessary Or Appropriate" Does Not Impose A Cost-Benefit Test

The Fifth Circuit concluded that 29 U.S.C. 652(8), which defines an "occupational safety and health standard" as a rule that requires conditions, means, methods or processes "reasonably necessary or appropriate to provide safe or healthful employment," imposes a cost-benefit requirement on toxic substances

[35] Every court of appeals (other than the Fifth Circuit in this case) that has considered the role of costs in standard setting has held (either explicitly or implicitly) that the Secretary need not undertake a cost-benefit study before establishing a toxic substances regulation. *American Iron and Steel Institute* v. *OSHA*, 577 F.2d 825 (3d Cir. 1978), petitions for cert. pending, Nos. 78-918 and 78-919 (coke oven emissions); *Society of the Plastics Industry, Inc.* v. *OSHA*, 509 F.2d 1301 (2d Cir.), cert. denied, 421 U.S. 992 (1975) (vinyl chloride); *Industrial Union Department, AFL-CIO* v. *Hodgson*, 499 F.2d 467 (D.C. Cir. 1974) (asbestos dust). Cf. *Turner Co.* v. *Secretary of Labor*, 561 F.2d 82, 86 (7th Cir. 1977) (ban on "life-threatening hazards" such as industrial carcinogens would not be subject to any cost-benefit test, even though regulation of other hazards under a section other than Section 655(b)(5) is so subject); *RMI Co.* v. *Secretary of Labor*, No. 78-3312 (6th Cir. Mar. 13, 1979), slip op. 10-12 (same).

standards issued under 29 U.S.C. 655(b)(5). The court of appeals is wrong. The phrase "reasonably necessary or appropriate" is not a limitation on the Secretary's powers or a substantive standard of any sort. It is, rather, a description of the rules produced by adherence to the criteria laid down elsewhere in the statute.[36]

Even if the phrase is given substantive meaning, however, it is not a brake on the exercise of powers

[36] Nothing in the lengthy legislative history of the Act suggests that the "reasonably necessary or appropriate" language is a description of the Secretary's duty, rather than (as we suggest) a description of rules that result if the Secretary conscientiously carries out the duties established by the substantive sections of the statute.

All but one of the original bills (see Leg. Hist. 659) contained a definition of "occupational safety and health standard" similar to the definition enacted as 29 U.S.C. 652(8). Some used only the phrase "reasonably necessary" rather than "reasonably necessary or appropriate," but otherwise they were identical. Leg. Hist. 3, 35, 78, 235, 532, 601, 631, 683, 725, 768, 937. Both the Senate and the House versions of the Act used the phrase "reasonably necessary or appropriate." *Id.* at 235, 937. No suggestion was made anywhere in the committee reports that the definition was intended to limit the scope of permissible standards. See *id.* at 166, 866. No such claim was made in the floor debates. The absence of any such assertion is telling, inasmuch as critics of the Act in both chambers assailed the Act for its requirement in Section 655(b)(5) that "absolute" health protection be provided to employees regardless of cost (see pages 59, 4a, 6a, *infra*). Indeed, so far as we can find, no mention was ever made of the phrase, aside from repeating it in the section-by-section explanations in the committee reports. In short, from beginning to end, the legislative record is devoid of evidence that the definition was meant to modify or even to describe the Secretary's duties under 29 U.S.C. 655(b)(5).

granted by other sections of the same Act. Where "the empowering provision of a statute states simply that the agency may 'make . . . such rules and regulations as may be necessary to carry out the provisions of [an] Act,' * * * the validity of a regulation promulgated thereunder will be sustained so long as it is 'reasonably related to the purposes of the enabling legislation.'" *Mourning* v. *Family Publications Service, Inc.*, 411 U.S. 356, 369 (1973) (footnote omitted). For example, where a statute authorized the FDA to promulgate drug regulations "necessary" to achieve the goal of a public health statute, this Court, in sustaining the regulations, observed that "[i]t is enough for us that the expert agency charged with the enforcement of remedial legislation has determined that such regulation is desirable for the public health * * *." *United States* v. *An Article of Drug* * * * *Bacto-Unidisk*, 394 U.S. 784, 786 n.2, 791-792 (1969). Statutes that authorize regulations "necessary or appropriate" to carry out the provisions of the statute have been similarly construed.[37] *FPC* v. *Texaco Inc.*,

[37] Where a federal statute authorizes an agency to issue regulations to further the goals of a statute, this Court regularly has held that the courts may not set aside the agency's regulations unless they are inconsistent with the goal of the statute or violate a requirement of the statute. *Bowles* v. *Willingham*, 321 U.S. 503, 519 (1944); *SEC* v. *Chenery Corp.*, 332 U.S. 194, 207 (1947); *American Trucking Associations* v. *United States*, 344 U.S. 298 (1953); *United States* v. *Storer Broadcasting Co.*, 351 U.S. 192, 201-203 (1956); *Thorpe* v. *Housing Authority of the City of Durham*, 393 U.S. 268, 280-281 (1969); *FCC* v. *National Citizens Committee for Broadcasting*, 436 U.S. 775, 796-797 (1978); *FERC* v. *Pennzoil Producing Co.*, No. 77-648 (Jan. 16, 1979), slip op. 8.

The Act provides that "[t]he determinations of the Secretary shall be conclusive if supported by substantial evidence in the record considered as a whole." 29 U.S.C. 655(f). The courts of appeals agreed that this substantial evidence test requires that factual determinations made by the Secretary be supported by substantial evidence. Policy determinations made by the Secretary need only be consistent with the statutory goal and any statutory requirements. See *Associated Industries of New York State, Inc.* v. *United States Department of Labor*, 487 F.2d 342, 347-350 (2d Cir. 1973); *Florida Peach Growers Ass'n* v. *United States Department of Labor*, 489 F.2d 120, 127-129 (5th Cir. 1974); *Industrial Union Department, AFL-CIO* v. *Hodgson*, *supra*, 499 F.2d at 472-476; *Synthetic Organic Chemical Manufacturers Association* v. *Brennan*, 503 F.2d 1155, 1158-1160 (3d Cir. 1974); *Society of the Plastics Industry, Inc.* v. *OSHA*, *supra*, 509 F.2d at 1303-1304; *American Iron and Steel Institute* v. *OSHA*, *supra*. The Fifth Circuit accepted this construction of Section 655(f) (Pet. App. 4a-5a). We believe that this conclusion, about which the parties are not in dispute, is correct. It shows that the usual principles of review of regulations, discussed in the preceding paragraph and in the text, must be applied here.

417 U.S. 380, 394 (1974); *Permian Basin Area Rate Cases*, 390 U.S. 747, 776 n.40 (1968); *United States* v. *Bush & Co.*, 310 U.S. 371, 380 (1940). And, where a statute permitted the ICC to establish "reasonable" regulations concerning railroad car availability and service, this Court concluded that the ICC could "rationally" conclude that its regulations served the statutory purpose despite the contention of the railroads that the short-term injury of the regulations far outweighed the long-term benefits. *United States* v. *Allegheny-Ludlum Steel Corp.*, 406 U.S. 742, 752-753 (1972).

The phrase "reasonably necessary or appropriate to provide safe or healthful employment" is in this tradition. So long as the standard meets the other requirements of the Act, Section 652(8) permits the Secretary to issue any standard that he rationally concludes is appropriate for the protection of the health and safety of employees under the substantive provisions of the Act.

The Fifth Circuit's reliance on *Aqua Slide 'N' Dive Corp.* v. *CPSC*, 569 F.2d 831 (5th Cir. 1978), which construes part of the Consumer Product Safety Act, was unwarranted. Although both statutes refer to standards "reasonably necessary" to achieve certain goals, the structures of the statutes are otherwise quite dissimilar. The "reasonably necessary" phrase in the Consumer Product Safety Act, 15 U.S.C. 2058 (c)(2)(A), appears in a clause authorizing the Consumer Product Safety Commission to set consumer product safety standards that are "reasonably necessary to eliminate or reduce *an unreasonable risk* of injury * * *" (emphasis added). The phrase thus appears in the clause granting the power to regulate, rather than in a collateral definition. The Consumer Product Safety Commission's responsibility, moreover, is to find that its rules are "reasonably necessary to eliminate or reduce an unreasonable risk of injury"; the Commission must consider "the probable effect of such rule upon the utility, cost, or availability of [the affected] products" and "any means of achieving the objective of the order while minimizing adverse effects on competition or disruption or dislocation of manufacturing and other commercial practices." 15 U.S.C. 2058(c)(1)(C), (D) and (2). Before the Commission may ban a product altogether as unsafe it must find that "no feasible consumer product safety standard * * * would adequately protect the public from the unreasonable risk of injury associated with such products." 15 U.S.C. 2058(c)(2)(C). The Consumer Product Safety Act thus recognizes that some products (*e.g.*, knives) pose a risk of harm that should be tolerated in light of their benefits; the Act permits regulation only of risks that are "unreasonable."[38] In contrast, OSHA does not limit the Secretary to regulating only "unreasonable" health risks; it authorizes the Secretary to eliminate, if feasible, all risks of material impairment that toxic substances pose to employees' health.

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[38] The Fifth Circuit observed in *Aqua Slide* that the CPSC cannot determine whether an "unreasonable risk" is presented without balancing the severity of the injury that may result from the product, discounted by the unlikelihood of the injury, against the harm the regulation itself will impose on manufacturers and consumers. 569 F.2d at 839.

Consumer product safety risks may be reasonable because the very feature that presents a risk (*e.g.*, the sharp edge of a knife) also offers a benefit. Consumers ought to be able to choose whether the risk to them is worth the benefit to them, and it is understandable that only hazards which are "unreasonable" are regulated. In contrast, occupational health hazards pose risks only to employees. The benefits (lower production costs) accrue in the main to employers and consumers. It is therefore understandable that 29 U.S.C. 655(b)(5) authorizes the Secretary to regulate all risks of material impairment to health caused by toxic substances rather than merely "unreasonable" health risks.

B. Section 655(b)(5) Prohibits Basing A Standard On A Cost-Benefit Test

If the Court agrees with the argument that 29 U.S.C. 652(8) does not require the application of cost-benefit criteria in making decisions about the level of exposure to toxic substances, it then must decide whether 29 U.S.C. 655(b)(5) requires cost-benefit analysis. We have pointed out above (see pages 41-42, *supra*) that the language of the statute contains no hint of such a requirement. To the contrary, the Secretary "shall" select "the" standard that "most adequately assures, to the extent feasible" that "no" employee shall suffer, even if exposed to the toxic substance "for the period of his working life." The Secretary has followed this mandate by ascertaining the level of exposure to a substance at which employees will not risk incurring the disease and then determining whether this exposure level is "feasible." If it is not feasible to attain the safe level, the Secretary adjusts the standard accordingly. But a court may not override this process with a cost-benefit balancing that could well require the Secretary to tolerate additional occupational illness in order to achieve lower costs when a stricter standard would be feasible; that squarely violates the no-material-impairment rule of the statute.

But no statute is so plain that resort to the legislative history is forbidden. See, *e.g.*, *United States* v. *Culbert*, 435 U.S. 371, 374 n.4 (1978); *Train* v. *Colorado Public Interest Research Group, Inc.*, 426 U.S. 1, 10 (1976). We therefore examine the legislative history of the Act and show that nothing in

the history supports the court of appeals' creation of a cost-benefit test. We then turn to a number of logical problems in the interpretation of the "feasibility" language of Section 655(b)(5) on which respondents rely.

1. *The legislative history establishes that Congress wanted the Secretary to regulate toxic substances by considering costs only as part of "feasibility"*

Foremost among the concerns of Congress in enacting OSHA was the ever-increasing number of toxic materials and harmful physical agents in the workplace. Leg. Hist. 142-143, 159-160, 411-415, 503, 510, 845-846, 1061. The Senate Committee on Labor and Public Welfare, for example, reported that toxic agents were a pernicious threat to employee health:

> Workers in the dusty trades still contract various respiratory diseases. * * * Carcinogenic chemicals, lasers, ultasonic [*sic*] energy, beryllium metal, epoxy resins, pesticides, among others, all present incipient threats to the health of workers. * * * It is estimated that every 20 minutes a new and potentially toxic chemical is introduced into industry. New processes and new sources of energy present occupational health problems of unprecedented complexity.
>
> Recent scientific knowledge points to hitherto unsuspected cause-and-effect relationships between occupational exposures and many of the then so-called chronic diseases—cancer, respiratory ailments, allergies, heart disease, and others. In some instances, the relationship appears to be direct: asbestos, ionizing radiation, chromates, and certain dye intermediaries, among others, are directly involved in the genesis of cancer. In other cases, occupation exposures are implicated

> as contributory factors. The distinction between occupational and nonoccupational illnesses is growing increasingly difficult to define.

Id. at 142.[39]

Death from such "silent killers" [40] was occurring because many employers had little economic incentive to provide healthful workplaces. "[M]any employers —particularly smaller ones—simply cannot make the necessary investment in health and safety, and survive competitively, unless all are compelled to do so." *Id.* at 144 (Senate Report). Because employees often moved from job to job, "an employer investing in current occupational health precautions would receive no future benefits, not even in the reduction of workmen's compensation costs. He might be paying for the past neglect of another employer." *Id.* at 854 (House Report).

In these circumstances, Congress concluded, the best approach was to impose a duty on all employers to provide workplaces as free from health hazards as possible. Congress recognized that achievement of this goal would require substantial investment in health protection (Leg. Hist. 444, 510, 525-526, 1004, 1030, 1040, 1150-1151), and that these costs "would be put into consumer goods * * *." *Id.* at 444 (Sen. Yarborough).[41] But Congress concluded that the ex-

[39] The House Committee on Education and Labor likewise identified exposure to toxic substances as a principal concern. *Id.* at 844-846.

[40] Leg. Hist. 1044-1045 (Rep. Udall).

[41] Congress anticipated that to some extent the cost of compliance would be recovered in savings in health care, workmen's compensation, lost wages and lost productivity. *Id.* at 142, 844-845, 1061.

pense of providing a safe and healthful place to work is a necessary and reasonable cost of doing business. Senator Eagleton observed that "[t]he costs that will be incurred by employers in meeting the standards of health and safety to be established under this bill are, in my view, reasonable and necessary costs of doing business. Whether we, as individuals, are motivated by simple humanity or by simple economics, we can no longer permit profits to be dependent upon an unsafe or unhealthy worksite." *Id.* at 1150-1151. Senator Williams, perhaps the principal author of the Act, stated that the cost of compliance was "the price we should pay for the 80 million workers in America." *Id.* at 444.[42]

Congress recognized that health standards would significantly increase the cost of doing business. It required these costs to be borne so long as it was feasible to do so. This fixes the balance between costs

[42] Senator Yarborough, a co-sponsor of the bill that was ultimately enacted, replied to the claim that the bill would be expensive (*id.* at 510):

> One may well ask too expensive for whom? * * * Is it too expensive for the employee who loses his hand or leg or eyesight? Is it too expensive for the widow trying to raise her children on meager allowance under the workmen's compensation and social security? * * *
>
> * * * * *
>
> We are talking about people's lives, not the indifference of some cost accountants. We are talking about assuring the men and women who work in our plants and factories that they will go home after a day's work with their bodies intact.

and benefits in a way that favors health. Consequently, Congress decided, economic hardship may not be a ground for obtaining a variance from a standard. 29 U.S.C. 655(b)(6)(C), 655(d); Leg. Hist. 160. For toxic substances, it decided that "the" standard which "most adequately assures, to the extent feasible" that "no" employee would suffer material health impairment during his entire working life must be adopted. But no Member of Congress so much as suggested that, because of cost-benefit considerations, the Secretary must tolerate risks, caused by toxic substances, that could be eliminated feasibly. Indeed, we can find no reference in the legislative history to cost-benefit techniques in any context whatsoever. The silence carries a persuasive message.[43]

The pattern and structure of the Act also demonstrate Congress' preference for health protection without regard to a particular balance against costs. Congress declared its purpose to be "to assure so far as possible" that every worker in the nation has a safe and healthful working environment. 29 U.S.C. 651(b). The Act imposes on all employers a duty to "furnish to each of his employees employment and a place of employment which are free from recognizable hazards that are causing or are likely to cause death or serious physical harm to his employees." 29 U.S.C. 654(a)(1). In adopting national consensus standards and established federal standards during the first two

[43] The Appendix to this brief contains a further discussion of the genesis of the toxic substances provision.

years of the Act, the Secretary was required to choose the standards that would result in improved safety or health. In the event of a conflict among possible standards, the Secretary was required to "promulgate the standard which assures the greatest protection of the safety or health of the affected employees." 29 U.S.C. 655(a). If the Secretary adopts a permanent standard that differs from an existing national consensus or established federal standard, the Secretary must explain why the change will better effectuate the purposes of the Act. 29 U.S.C. 655(b)(1). Where the standard deals with toxic substances, 29 U.S.C. 655(b)(5) requires that the Secretary adopt "the" standard which "most adequately assures, to the extent feasible, that no employee will suffer material impairment of health or functional capacity even if such employee has regular exposure to the hazard dealt with by such standard for the period of his working life." Variances from standards may be obtained, but only on carefully limited grounds—financial hardship is *not* a ground for a variance.[44] 29 U.S.C. 655(b)(6)(C) and 655(d).

[44] Although financial hardship is not an excuse for noncompliance, the Secretary's enforcement program takes hardship into account in working out abatement programs consistent with the purposes of the Act. The Secretary's Industrial Hygiene Field Operations Manual, which sets forth procedures for enforcement of health standards, states:

> The employer's economic cost of abatement will not be considered to be a factor in the issuance of a citation. However, if the cost of utilization of effective engineering or administrative controls, or combination, which would bring the employer into compliance with permissible

See note 7, *supra*. Financial hardship is to be relieved directly only through small business loans to assist employers in complying with standards. 15 U.S.C. 636.

In short, at every turn in the statute Congress expressed a preference for maximum feasible health protection.[45] That Congress failed to qualify this goal in any way with a requirement that the benefits be measurable, refused to allow variances on the ground of financial hardship, and limited its only financial relief to small business loans demonstrates that Congress carefully did not require any cost-benefit test. The court of appeals erred in reading into the statute "what Congress has studiously omitted." *FTC* v. *Simplicity Pattern Co.*, 360 U.S. 55, 67 (1959);

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exposure limits would so seriously jeopardize his financial condition as to result in the probable shutdown of his establishment or a substantial part, then only a personal protective equipment program should be required in the interim, and an extended abatement date should be granted to permit the extended implementation of feasible engineering or administrative controls taking into account the employer's financial condition. The burden of proof of economic infeasibility rests upon the employer. Any abatement date based on economic grounds shall be approved by the Regional Administrator.

Empl. Safety & Health Guide (CCH) ¶ 4483.80, § 3.8(b)(1) (1979). See also *Atlantic & Gulf Stevedores, Inc.* v. *OSHRC*, 534 F.2d 541 (3d Cir. 1976).

[45] See *SEC* v. *Sloan*, 436 U.S. 103, 121 (1978); *Train* v. *Natural Resources Defense Council, Inc.*, 421 U.S. 60, 86 (1975) (scope of agency's rulemaking powers determined in part by examination of the pattern and structure of the statute in question).

Great Atlantic & Pacific Tea Co. v. *FTC*, No. 77-654 (Feb. 22, 1979), slip op. 8-9.

2. *The requirement that standards be "feasible" refers to practicability rather than to a cost-benefit balance*

29 U.S.C. 655(b)(5), which authorizes toxic substance standards, has both a procedural directive and a substantive criterion.[46] Procedurally, the Secretary must consider the best available evidence, the latest experience in the field; he must base standards on experiments, research, and such other information as may be appropriate. Substantively, the Secretary must set "the" standard that "most adequately assures, to the extent feasible" the "highest degree of health and safety protection." There is no room in this scheme for the Secretary to set standards by weighing the value of life and ~~death~~ health against the cost of their preservation. Congress has done that; it struck the balance in favor of maximum health protection, subject only to the requirement of feasibility. The "lowest feasible level" policy of the Secretary (see pages 20-25, *supra*) satisfies the imperative. The Fifth Circuit's cost-benefit test violates it.[47]

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[46] The language is quoted in full at page 3, *supra*.

[47] This does not mean that the Secretary may never weigh costs and benefits where sufficient data exist to do so. To the contrary, the Secretary is required to set priorities in the use of his own time and resources according to the severity of the need for achieving better health and safety protection against various hazards. 29 U.S.C. 655(g). In determining where the need for prompt rulemaking is the greatest, the Secretary may take the relative costs and benefits of the

Respondents may contend that the phrase "to the extent feasible" in Section 655(b)(5) itself imposes a cost-benefit requirement. The court of appeals did not accept this argument, and for good reasons.

The word "feasible" does not require any cost-benefit test. The ordinary meaning of "feasible" is "capable of being done." See *Webster's Third New International Dictionary* 831 (1971).[48] The word does not refer to the desirability or benefit of doing something; it refers, instead, to the ability of doing something. That is how Congress has consistently employed "feasible" in health or safety legislation. Congress' understanding is clearly conveyed by another statute enacted the same week as OSHA.[49] This

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existing standards and the proposed standards into account. But once the Secretary decides to issue a standard for toxic substances, he must satisfy the requirements of Section 655(b)(5).

[48] See also I *Compact Oxford English Dictionary* 973: "Capable of being done, accomplished or carried out; possible, practicable."

[49] Section 211(c)(2)(A) and (B) of the Clean Air Act authorizes the EPA to regulate, control or prohibit automobile fuel additives. Control or prohibition of additives that endanger the public health was permitted only after "consideration of other technologically or economically *feasible* means of achieving emission standards * * *." In contrast, control or prohibition of additives which may impair effective operation of emission control devices was permitted only after consideration of "*a cost benefit analysis*" comparing device performance with and without the control or prohibition. 42 U.S.C. 7545(c)(2)(A) and (B) (emphasis added).

Later Congresses likewise recognized the difference between a feasibility requirement and a requirement that economic effects be balanced or considered. The Consumer Product Safety Act of 1972 permits the Consumer Product Safety Commission to regulate product hazards after it considers the risks presented by a product and the economic effects of its proposed safety rule. 15 U.S.C. 2058 (c)(1)(C) and (D). The Commission may take the more drastic step of banning the product altogether only after finding that no "feasible" safety rule would provide sufficient protection. 15 U.S.C. 2057. Section 325 of the Energy Policy and Conservation Act of 1975, 42 U.S.C. 6295, requires promulgation of energy conservation standards. Section 325(a) specifies that a standard must be "economically justified." A standard is economically justifiable only if the Secretary of Commerce finds both that the benefits of the standard outweigh its costs and that the standard is "economically feasible." "Feasibility" is defined as "capable of being carried out." S. Rep. No. 94-516, 94th Cong., 1st Sess. 172 (1975); H.R. Conf. Rep. No. 94-700, 94th Cong., 1st Sess. 172 (1975).

Court, too, has understood that "feasible" means capable of achievement. See *Union Electric Co.* v. *EPA*, *supra*. Respondents do not dispute that the benzene standard is feasible in this sense—it can be achieved at bearable cost with available technology.[50]

Moreover, if "to the extent feasible" means "to the extent justified by the costs of doing so," then most of Section 655(b)(5) is sapped of meaning. The words requiring the Secretary to set "the" standard

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[50] Economic considerations necessarily play a substantial role in the Secretary's determination that a particular level of exposure is feasible. It may be technologically possible to make benzene on the moon, but if doing so were the only way to reduce exposure, the suggestion would not be feasible. The Secretary takes economic considerations into account in determining what is feasible. For example, considerations of economic feasibility were important in setting the level of exposure to cotton dust in certain textile operations (43 Fed. Reg. 27360 (1978)), and the Secretary allowed the inorganic lead industry additional time (as much as 10 years) to imple-

that "most" adequately assures that "no employee will suffer material impairment of health * * * even if [exposed to the hazard] for the period of his working life" would become nugatory. A construction that renders state language meaningless should be avoided if possible. *Weinberger* v. *Hynson, Westcott & Dunning*, 412 U.S. 609, 633 (1973); *Jarecki* v. *G.D. Searle & Co.*, 367 U.S. 303, 307 (1961). Here there is no reason why these words should be disregarded—they are the heart of the statute. Indeed, giving the "feasibility" language a cost-benefit meaning would turn the statute on its head. Standards for hazards other than toxic substances and harmful physical agents are governed by other sections that lack the "feasibility" phrase. If the feasibility language is the source of a cost-benefit requirement, then *only* toxic substances rules need to meet such a test. That is topsy-turvy, because the entire structure of the Act establishes that Congress wanted toxic substances placed under controls far more strict than those applicable to simple hazards (such as slippery floors, which also are subject to regulation). See pages 6a-7a in the Appendix, *infra*.

The submission that "feasible" means "capable of being achieved" within the range of acceptable costs

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ment the exposure levels for similar reasons (43 Fed. Reg. 52978, 53008 (1978)). In this case the Secretary examined the capitalization of firms, the profitability of businesses, and other factors in determining that the cost of the standard was bearable. See Pet. App. 134a-163a. Because respondents do not dispute the economic feasibility of the benzene standard, it is unnecessary to discuss here what criteria the Secretary should use in making these judgments.

(see note 50, *supra*) is supported by the legislative history of Section 655(b)(5). Section 655(b)(5) was inserted to assure "so far as possible" that standards would prevent material health impairment:

> Such standards should be directed at assuring, so far as *possible*, that no employee will suffer impaired health or functional capacity, or diminished life expectancy, by reason of exposure to the hazard involved, even though such exposure [to the hazard] may be over the period of his entire working life.

Leg. Hist. 147 (Senate Report) (emphasis added).

In the Senate members objected to the original language of Section 655(b)(5), which would have required the Secretary to establish the standard that "most adequately and feasibly assures" that no employee will suffer material health impairment. It was argued that this language would mandate "absolute safety," which is an "impossibility." Leg. Hist. 480-481. Other criticism, in the same vein, is discussed in the Appendix, *infra*, 4a-8a. In response to this criticism, Congress restricted Section 655(b)(5) to standards for "toxic materials or harmful physical agents," rather than all standards, as was originally proposed, and modified the feasibility language to its present version. Leg. Hist. 502-503. It is difficult to believe that this debate would have occurred without mention that the word feasible was intended to impose a cost-benefit requirement, if that were Congress' purpose. Not once, however, throughout the entire legislative history of 29 U.S.C. 655(b)(5) is there any suggestion of such a meaning. In sum, the plain language of Section 655(b)(5) and its legisla-

tive history are irreconcilable with the Fifth Circuit's cost-benefit test.

3. *The requirement that the Secretary make decisions on the basis of the "best available evidence" precludes any role for cost-benefit analysis if the necessary data are not "available"*

Section 655(b)(5) instructs the Secretary to act on the basis of the "best available evidence." Congress was aware of the "frightening gap" between "our knowledge about [toxic] substances, and what we need to know" (Leg. Hist. 1044-1045). The best-available-evidence provision was inserted because "it [was] not intended that the Secretary be paralyzed by debate surrounding diverse medical opinions." *Id.* at 848. This provision fortifies the conclusion that a cost-benefit analysis is unnecessary under the statute; even if such an analysis sometimes can be conducted, the data are not always "available." Where, as here, "the factual finger points [but] does not conclude" (*Society of the Plastics Industry, Inc.* v. *OSHA*, 509 F.2d 1301, 1308 (2d Cir.), cert. denied, 421 U.S. 992 (1975)), the Secretary can promulgate standards now whether or not more complete evidence could be made available in the future.

The significance of the best-available-evidence provision is two-fold. First, it supports our construction that the Act never requires the Secretary to engage in cost-benefit balancing. Because Congress was aware of the gaps in medical research concerning toxic substances,[51] Congress could not have intended

[51] As of 1969 more than 6,000 chemicals were in use in occupational settings, and it was estimated that every twenty minutes a new and potentially toxic substance was introduced into industry. Health authorities could demonstrate safe levels of exposure for only 500 of these substances. Leg. Hist. 412, 1044. Emphasizing the "frightening gap between our knowledge about [toxic] substances, and what we need to know," Rep. Udall stated that it was not possible to calculate "how many workers have been struck down by silent killers in the form of corrosive chemicals, noxious fumes, and debilitating dust particles that have become commonplace ingredients of the manufacturing process." Leg. Hist. 1044-1045.

to impose a cost-benefit requirement that in numerous instances would frustrate all regulation because even the best available evidence would not be good enough. To construe the statute to require quantification not possible even with the "best available evidence" would "impute to Congress a purpose to paralyze with one hand what it sought to promote with the other." *Weinberger* v. *Hynson, Westcott & Dunning, supra*, 412 U.S. at 631, quoting *Clark* v. *Uebersee Finanz-Korp.*, 332 U.S. 480, 489 (1947). Second, even if the Act imposes a cost-benefit requirement where evidence *is* available to assess costs and benefits, that requirement must yield where the best available evidence is insufficient. Either construction of the best-available-evidence clause requires reversal in this case, because the court of appeals conceded that the best available evidence is not good enough to enable the Secretary to determine the relationship between exposure to benzene and risk of cancer (Pet. App. 19a n.23).

This is enough, we submit, to show that the Fifth Circuit's approach should be rejected. But because the court of appeals apparently thought that its cost-benefit test would not be excessively burdensome, we

try to show in the next few pages that the court is wrong. Its two-step test imposes the very paralysis that Congress sought to avert.

Under the court of appeals' approach the Secretary must quantify the cancer risk, that is, construct a dose-response curve showing how much cancer is caused by each of the low levels of exposure in question (1 to 10 ppm). Once the cancer risk is measured, with whatever degree of accuracy the court requires, the Secretary must demonstrate that the health benefits bear a "reasonable relationship" to the cost of achieving them. Although serious methodological obstacles attend the second step,[52] the Secretary will be unable to satisfy even the first step in many cases.

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[52] Even when available data are sufficiently reliable to permit the probable health benefits of a standard to be predicted, accurately, there are problems in using cost-benefit criteria to set an exposure standard where, as here, it is possible to set a "feasible" exposure limit and reduce the risk of employees more directly. The most important difficulty in setting a higher-than-feasible exposure level using cost-benefit techniques is placing an economic value (implicit or explicit) on life, health, bereavement, pain and suffering, and other consequences of occupational disease and death. There is no generally accepted method for valuing such considerations, even implicitly. See Senate Comm. on Governmental Affairs, 95th Cong., 2d Sess., Study on Federal Regulation, Vol. VI, at XXIV (Comm. Print 1978). For a discussion of the various methods occasionally proposed to quantify the value of life and other intangibles, see 41 Fed. Reg. 46742, 46751 (1976) (coke-oven-emissions preamble). See generally Fried, *The Value of Life*, 82 Harv. L. Rev. 1415 (1969); Rhoads and Singer, *What is Life Worth?*, 51 Pub. Interest 74 (Spring 1978). Second, there is no general agreement concerning whether a stream of health benefits and saved lives extending into the future should be discounted to present value in the same way that

The court of appeals' approach seems to require the Secretary simply to identify the benefits of reducing exposure from 10 ppm to 1 ppm, an entire order of magnitude. Relatively accurate measurements of such benefits eventually may be within the reach of medical science, as the court of appeals thought. But the court of appeals' analysis cannot logically be confined to changes in this magnitude. It is entirely fortuitous that the national consensus standard of benzene exposure was 10 ppm; the court of appeals' approach would require the Secretary to identify the benefits of moving from 5 ppm to 1 ppm, if that had been the proposed change. Or if the Secretary had proposed a decrease from 10 ppm to 5 ppm, the court of appeals would have demanded to know the benefits of that course. The smaller the proposed decrease in question, the more difficult it is to learn its benefits, and thus the more difficult it becomes to satisfy the court of appeals' requirements.

In fact, despite the superficial reasonableness of the court's approach, its test could not be satisfied until the Secretary has learned and can quantify with

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future economic values are generally discounted in awarding tort damages. Third, the Secretary has found that industry tends to overestimate the cost of implementing proposed standards, which makes it difficult accurately to weigh benefits against costs. For example, industry asserted that the Secretary's vinyl chloride standard would seriously disrupt the industry. In fact, however, the industry promptly complied, at a cost much lower than it had projected, by devising new technology to meet the standard. Vinyl chloride production has continued to increase. See Doniger, *Federal Regulation of Vinyl Chloride: A Short Course in the Law and Policy of Toxic Substances Control*, 7 Ecol. L.Q. 497 (1978).

useful precision the benefits to be obtained by reducing exposure through each part of the critical range. Unless the Secretary can learn these savings, he will be confronted with the demand in tomorrow's case that he show what *part* of a reduction in exposure contributes to what *part* of the saving of life. For example, if 10 years from now the Secretary learns with satisfactory certainty that a reduction in exposure to benzene from 10 ppm to 1 ppm would save 100 lives every year, industry will respond: "How do you know that a reduction to 1 ppm is necessary? What if all of the savings are achieved by a drop to 5 ppm, making the further reduction superfluous?" And that response will have substantial force if, as is often the case, the first step of a reduction (say, from 10 ppm to 5 ppm) can be achieved quite easily, while the further five-fold reduction to 1 ppm is costly. If 95% of the cost of reducing exposure from 10 ppm to 1 ppm lies in the reduction from 5 ppm to 1 ppm, then—if the court of appeals is correct—the Secretary surely must show what benefits are achieved by the reduction from 5 ppm to 1 ppm. It will not be enough to show the benefits of the entire drop; they must be shown segment-by-segment.[53]

[53] In other words, the court's approach would call for substantial evidence that risk drops as, say, a linear function of exposure rather than as a quadratic function. If the dose-response curve looks more like a parabola than like a straight line, the gains from reducing exposure below a certain level may become vanishingly small. But because of difficulties in the data (discussed in the text *infra*), the method by which results are extrapolated from high levels to low ones must be based on a non-verifiable choice of shape for the curve. The

It should be clear, however, that medical science cannot supply sufficiently useful approximations in such an exercise. The very obstacles that prevented the ~~Secretary~~ Secretary from attempting to measure the benefits of a reduction from 10 ppm to 1 ppm demonstrate this. Given the deficiencies in studies of the consequences of human exposure to benzene, it will be years before science accumulates enough information on even so substantial a decrease. This is so principally because there is very little information available on the actual concentrations of benzene at which health effects have been observed. Unless concentrations can be identified with some accuracy, scientists cannot extrapolate from their observations. Moreover, because leukemia often does not become manifest until long after the exposure to its cause (see Pet. App. 117a), it will be decades before all of the cancers caused by the exposure at the 10 ppm level are discovered (see Exh. 2-58 at 50-56). The exposure records of many workers exposed to benzene at other levels in other years may be lost—if any were kept—and this hinders reconstruction of a group of exposed workers for pur-

decision whether to try to fit a linear rather than a parabolic curve to the known observations, given the lack of adequate knowledge about how cancer is caused, is a choice of policy rather than of fact. In these circumstances the choice of one approach over another could not be justified by substantial evidence. Extrapolations based on a model so chosen thus could not answer the court of appeals' apparent demand for "harder" data. See McGarity, *Substantive and Procedural Discretion in Administrative Resolution of Science Policy Questions: Regulating Carcinogens in EPA and OSHA*, 67 Geo. L.J. 729, 735 n.27, 806 (1979).

poses of comparison.[54] Finally, because workers move from job to job, and may be exposed to different carcinogens in different jobs, it is quite difficult to determine which of the observed cancers in any group are attributable to exposure (or to how much exposure) to benzene.

These formidable difficulties pertain to the measurement of the incidence of cancer at the 10 ppm level. The difficulties in estimating the amount of cancer at the 1 ppm level—or any other level that is not now employed—are even more serious. If analysis of the data concerning cancers occurring at high levels of exposure leads to uncertainties, extrapolations to lower levels from these data are even more uncertain (Pet. App. 119a-120a).

The court of appeals did not give any reason for concluding that these difficulties and uncertainties can be overcome. The Secretary, who has a substantial scientific staff and a decade's experience in the

[54] For example, the Infante study of Goodyear employees exposed between 1940 and 1949 (see note 17, *supra*) was frustrated by the unavailability of sufficiently accurate data about exposure levels (Exh. 2-5 at 3; Tr. 806, 813-814, 1055-1056, 1156, 2506-2507). The data showed exposure peaks in some cases exceeding 200 ppm, but they did not reveal how much of the total exposure was attributable to these peaks and how much to the approved levels (19 ppm to 100 ppm). It cannot be determined whether the workers wore respirators in some situations, thus reducing exposure. Dr. Infante concluded that no reliable estimates of exposure could be established, and thus that it was not possible to establish a correspondence between the level of exposure and risk (see note 56, *infra*). The other studies in the record suffer from the same deficiencies (Pet. App. 99a-104a, 120a-122a, 160a).

administration of toxic substances regulation, has concluded that they cannot, at least within the foreseeable future. The Secretary's view that there is much to be learned, and much progress to be made, before risk assessments could be devised to meet the court of appeals' demands is consistent with the Interagency Regulatory Liaison Group's *Report on Scientific Bases for Identifying Potential Carcinogens and Estimating Their Risks* (Feb. 6, 1979). This *Report*, prepared by representatives of OSHA, the Consumer Product Safety Commission, the Food and Drug Administration and the Environmental Protection Agency, concluded that the state of the art permits only a "rough estimate * * * which may be useful in setting priorities among carcinogens and in obtaining a very rough idea of the magnitude of the public health problem posed by a given carcinogen." *Id.* at 76, 77. And even that much—which does not include determination of measurable benefits of the sort envisioned by the Fifth Circuit—can be achieved only if the data are available.[55]

[55] We do not mean by this that analyses of the costs of achieving a given level of protection are useless or should be avoided. Far from it; they provide information that is in some cases very valuable. The President has encouraged their use. Exec. Order No. 12044, 43 Fed. Reg. 12661, 12663 (1978). In recognition of their value, the President has proposed legislation that would, if adopted, require any agency in promulgating a major rule to prepare "an analysis of the projected benefits and the adverse economic and other effects of the rule" and either an explanation "why the rule attains its objectives, in a manner consistent with applicable statutes, with less adverse economic effects than the other alternatives con-

The Secretary, under a statutory obligation to use the best "available" evidence, resolved the uncertainties presented here in favor of safety. We have discussed in detail at pages 15-25, *supra*, how the Secretary weighed the competing considerations and how he resolved the numerous uncertainties. The court of appeals did not fault the Secretary's performance in this respect. Because the Secretary did the best he could with the best "available" evidence, the court of appeals' insistence that the Secretary create more

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sidered" or "why an approach entailing greater adverse economic effects was selected." S. 755, 96th Cong., 1st Sess. § 3 (1979). Our point here, rather, is that the cost analysis of this sort is quite different from a cost-benefit balancing for setting the level of protection in the first instance.

The Secretary also uses risk-assessment techniques where that is possible to evaluate whether a reduction in exposure would produce some benefit, and thus to show some health need for the standard. See note 47, *supra*. For example, in the coke-oven-emissions case, the Secretary conducted such a study. The results are discussed at note 15 of our memorandum in response to the petitions in Nos. 78-918 and 78-919. But as that discussion shows, even those studies have obvious limitations.

The Secretary makes even greater uses of risk assessments when dealing with non-carcinogens. For example, in establishing the permissible exposure level for lead, the Secretary was able to assess the extent of risk, identify different populations that faced risk thresholds at different levels of exposure, and consider these factors in setting the permissible exposure level. See 43 Fed. Reg. 52952, 52960-52972 (1978). In some instances "safe" levels of exposure to non-carcinogens can be determined. The determination of safe levels, once made, can be the basis for satisfying the statutory criteria without reducing exposure to the lowest feasible levels. Here, too, however, the technique was used to identify the nature and extent of health needs rather than to balance costs against benefits.

evidence was unjustified.[56] Cf. *Permian Basin Area*

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[56] The court of appeals suggested that the Secretary await the results of animal studies before ordering reductions in exposure to benzene (Pet. App. 20a n.25). But, as the court recognized, it has not been shown that benzene causes cancer in animals. It has, however, been shown that benzene causes cancer in humans; no one disputes this. Under these circumstances, it is difficult to understand what increase in precision might be achieved by waiting for the accumulation of evidence that, by any standard, is not "available." See Pet. App. 119a-120a (discussing animal studies).

The court of appeals also concluded that some evidence now available showed that more "valid extrapolations" would become available in the future (Pet. App. 19a n.23). Aside from the obvious fact that what might become available in the future is not available now, the court of appeals' excursion into the risky business of scientific prediction is open to serious dispute; it is at odds with the record and with the Secretary's conclusions.

First, the court relied on Dr. Richard Wilson's "preliminary risk assessment" showing that only two deaths every six years would be averted by the reduction in exposure to 1 ppm. (A. 176). The Secretary, however, rejected Dr. Wilson's conclusion because: (1) Dr. Wilson conceded that the reliability of the data on which he based his "guess" (Tr. 2772; A.92) was "quite poor" (Tr. 2720); (2) Dr. Wilson gave no basis for his conclusions at the hearing (Tr. 2743, 2790-2798), and, although he agreed to supply this information to the Secretary (Tr. 2752-2753), he never did so; (3) Dr. Wilson improperly dismissed the Infante study as unreliable (Pet. App. 107a); and (4) Dr. Wilson underestimated the number of workers who are regularly exposed below 10 ppm benzene concentrations. See Pet. App. 161a-162a.

Second, the court asserted that Dr. Lawrence Partridge, a member of the staff of the Secretary's economic consultant (Arthur D. Little, Inc.), stated that his firm could "perform a cost-effectiveness analysis for the benzene standard." In fact, the Secretary's consultant stated only that his firm was generally qualified to perform cost-effectiveness studies. He did not testify that sufficient data to perform such a study existed

Rate Cases, *supra*, 390 U.S. at 776 n.40; *NAACP* v. *FPC*, 425 U.S. 662, 672 (1976) (Powell, J., concurring).

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In sum, the Secretary's position is that the toxic substances provision of OSHA neither requires nor permits him to establish exposure levels on the basis of tradeoffs, identified by cost-benefit techniques, between health benefits and costs. Even if the statute permits such a tradeoff, it does so only when the evidence to make such a decision is "available," which is not the case for benzene. This is not to say that costs and benefits play no role in the statutory scheme. They clearly do. There must be substantial evidence for concluding that a lower exposure level

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for benzene (Tr. 512). To the contrary, his economic report specifically stated the data did *not* exist with regard to benzene (Exh. 5A at 3-5).

Third, the court of appeals observed that, after the close of the record in this case, the EPA had released a preliminary report on the relationship between cancer and benzene. See *Preliminary Report on Population Risk to Ambient Benzene Exposures* (1978) (A. 14-29). The EPA, however, emphasized that its estimates were devised by "very crude methods" (A. 25). This report, moreover, was based on the data collected by Dr. Infante, who stated that, in his view, the exposure data were too imprecise to establish a dose-response relationship (Tr. 874, 927, 928, 1050, 1056, 1129-1130, 1155-1156; see also Dr. Goldstein, Exh. 75 at 2-3). The Secretary agreed with Dr. Infante. That EPA may have concluded that its risk estimate is usable for its own purposes (such as confirming that the levels of benzene now found in the ambient air pose a public health hazard) is no basis for disturbing the Secretary's judgment that the same evidence is not useful for a quite different purpose. Cf. *Universal Camera Corp.* v. *NLRB*, 340 U.S. 474, 476 (1951).

will be beneficial; here there was such evidence, as the court of appeals acknowledged (Pet. App. 18a). Risk assessment can be employed to identify safe levels of exposure for some substances (see note 55, *supra*). And the cost of compliance can be considered in at least five ways: (1) in setting regulatory priorities (see note 47, *supra*); (2) in defining what level of exposure can be achieved feasibly (see pages 56-59 and note 50, *supra*); (3) in selecting the method by which employers must achieve the lowest feasible level of exposure;[57] (4) in granting variances under which less expensive, but equally effective, methods of control can be substituted for those specified by the Secretary (see note 7, *supra*); and (5) in the course of enforcing the standards (see note 44, *supra*). Our point is not that the statute has deprived the Secretary of the flexibility necessary for the establishment of intelligent public health policy. But it has forbidden the kind of tradeoff required by the court of appeals, and the court's requirement that the Secretary produce an "estimate of expected benefits" (Pet. App. 20a), and determine by a weighing of those benefits against the cost that the regulation bears a "reasonable relationship" to quantifiable benefits, is improper.

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[57] See *South Terminal Corp.* v. *EPA*, 504 F.2d 646, 655-656, 657, 676 n.33 (1st Cir. 1974): where Congress has forbidden the EPA to balance costs against benefits under a particular statute, "[t]urning down necessary controls because they are economically burdensome is impermissible; selecting the least burdensome effective alternative simply makes good sense."

C. Any Ambiguities In The Statute Should Be Resolved In Favor Of Greater Safety

The very most that can be said for the court of appeals' approach is that the phrases "reasonably necessary or appropriate to provide safe or healthful employment" and "to the extent feasible" are arguably ambiguous. The court of appeals resolved the ambiguity by selecting a cost-benefit requirement that, in the court's view, best served the public interest. The court overlooked two principles that should have dissuaded it from resolving the perceived ambiguity as it did.

First, OSHA is remedial legislation dealing with the public health and safety. Many cases hold that ambiguities in such legislation should be resolved in favor of safety rather than, as the court of appeals held, in favor of lower costs for industry.[58]

Second, since OSHA was enacted, the Secretary has construed the toxic substances provision of 29 U.S.C. 655(b)(5) as requiring the achievement of the lowest achievable level of exposure where a safe level cannot be determined. The Secretary has promulgated eight standards regulating exposure to carcinogens and other toxic substances (see note 24, *supra*). In almost all of the eight, the Secretary has explained that no safe level of exposure

[58] See, *e.g.*, *E.I. duPont deNemours & Co.* v. *Train*, 430 U.S. 112, 133 (1977); *FPC* v. *Florida Power & Light Co.*, 404 U.S. 453, 469 (1972); *United States* v. *Seaboard Air Line R.R.*, 361 U.S. 78, 83 (1959); *Voris* v. *Eikel*, 346 U.S. 328, 333 (1953); *Tiller* v. *Atlantic Coast Line R.R.*, 323 U.S. 574, 577 n.2 (1945); *Lilly* v. *Grand Trunk Western R.R.*, 317 U.S. 481, 486 (1943).

to such substances can be determined, concluded that in such circumstances the standard must be set at the lowest achievable level, and rejected arguments that the statute requires the level of exposure to be set by reference to cost-benefit criteria.[59] The agency's experience over the course of a decade, the Secretary recently said, "has demonstrated to us the futility of applying traditional cost-benefit analysis and methodology to the workplace health context." 43 Fed. Reg. 45762, 45790 (1978) (explanation of the acrylonitrile standard).

The Secretary's consistent and well-articulated construction of the Act is entitled to substantial deference. *E. I. duPont deNemours & Co.* v. *Collins*, 432 U.S. 46, 53-54 (1977); *Miller* v. *Youakim*, No. 77-742 (Feb. 22, 1979), slip op. 18 (and cases cited therein). An agency enjoys substantial leeway when it must interpret a new statute and fashion a solution on the basis of imperfect data. *Permian Basin Area Rate Cases*, 390 U.S. 747, 777 (1968). Deference to the agency's approach is all the more appropriate where, as here, the agency's interpretation is supported by the agency's practical experience in implementing the statute, see *American Trucking Associations* v. *Atchison, Topeka & Santa Fe Ry.*, 387 U.S. 397, 416 (1967); *Skidmore* v. *Swift & Co.*, 323

[59] See especially 39 Fed. Reg. 35890, 35892 (1974) (vinyl chloride); 41 Fed. Reg. 46742, 46751 (1976) (coke oven emissions); 43 Fed. Reg. 27350, 27378-27389 (1978) (cotton dust); 43 Fed. Reg. 52952, 52963 (1978) (lead dust); 43 Fed. Reg. 45762, 45790 (1978) (acrylonitrile). See also 37 Fed. Reg. 11318 (1972) (asbestos dust); 39 Fed. Reg. 3756, 3758 (1974) (14 selected carcinogens).

U.S. 134, 140 (1944), and the statute in question is a complex one requiring scientific expertise, see *Train* v. *Natural Resources Defense Council, Inc.*, 421 U.S. 60, 87 (1975), *E. I. duPont deNemours & Co.* v. *Train*, 430 U.S. 112, 135 n.25 (1977). Certainly the Secretary's construction is "sufficiently reasonable to preclude the court of appeals from substituting its judgment for that of the Agency." *Train* v. *Natural Resources Defense Council, Inc.*, *supra*, 421 U.S. at 87.

II

THE SECRETARY WAS NOT REQUIRED TO WAIT FOR MORE EVIDENCE BEFORE RESTRICTING DERMAL CONTACT WITH BENZENE-BEARING LIQUIDS

The Secretary determined that dermal contact with liquids containing benzene creates a risk of cancer, and he accordingly ordered workers to wear protective clothing to avert that risk (see pages 25-28, *supra*). The court of appeals held that the Secretary's decision that benzene is absorbed through the skin is supported by substantial evidence (Pet. App. 25a). Despite the statutory command in 29 U.S.C. 655(f) that "[t]he determinations of the Secretary shall be conclusive if supported by substantial evidence" and despite the command in 29 U.S.C. 655(b)(5) that toxic substances regulations shall be based on the best "available" evidence, the court set aside the dermal contact rules on the ground that other evidence that might become available in the future would throw more light on the subject.

The court of appeals was wrong for several reasons. First, in setting aside a standard despite the presence of substantial evidence, the court disregarded 29 U.S.C. 655(f). Second, in considering the prospect of a study not in the record, the court overlooked the rule that "review of administrative decisions is to be confined to 'consideration of the decision of the agency * * * and of the evidence on which it was based'." *FPC* v. *Transcontinental Gas Pipe Line Corp.*, 423 U.S. 326, 331 (1976), quoting from *United States* v. *Carlo Bianchi & Co.*, 373 U.S. 709, 714-715 (1963). Third, the court transgressed 29 U.S.C. 655(b)(5), which limits decisions to the "available" evidence.

The court of appeals' instruction to the Secretary to await the production of additional evidence could be justified only if the phrase "best available evidence" in Section 655(b)(5) means "the best evidence capable of being produced." But the legislative history of the "best available evidence" rule, which we discuss at pages 60-61, *supra*, shows that the phrase was intended by Congress to mean "the best evidence in existence," rather than "the best evidence capable of being produced." Congress was aware of the potential for paralysis that medical disputes could introduce into the administrative process. There is always more evidence just around the corner. Congress intended the "best available evidence" approach to free the Secretary from the grip of claims that he should wait for just one more study, sure to be conclusive. As the House Committee put the matter

(Leg. Hist. 848): "The Committee feels it is vital that when the Secretary sets an occupational health standard he do so on the basis of the best available professional evidence; it is not intended that the Secretary be paralyzed by debate surrounding diverse medical opinions." By insisting that the Secretary wait for just one more study—which the court of appeals thought would be definitive—the court of appeals introduced the very paralysis that Congress wanted to avoid.

The circumstances of this case well show the importance of the "best available evidence" rule and the difficulties caused by insisting on the accumulation of more evidence. The court of appeals held that the agency should have obtained and considered the results of tests using radioactive benzene. The court said that these tests would have provided conclusive answers in six to twelve weeks to the question whether benzene is absorbed through the skin, as well as several other allied questions (Pet. App. 25a-26a). The agency thus violated, in the court's view, the directive in Section 655(b)(5) that standards be based on "research, demonstrations, experiments" and "the latest available scientific data in the field." The court did not deny that the record is replete with "research," "demonstrations," and "experiments" on the skin-absorption issue and included the best scientific evidence available at the time of the rulemaking proceeding.[80] The court held, however, that Section 655(b)(5) requires the Secretary "to acquire" (Pet. App. 27a) a radioactive benzene study before issuing any dermal prohibition and protective clothing requirement.[81]

[80] The standard was in part based on the fact that benzene causes dermatitis, which, aside from its own health effects, increases the risk that benzene will be absorbed through the damaged skin. The court dismissed the agency's theory that dermal contact causes dermatitis as a "post hoc rationalization" (Pet. App. 22a). This was hardly so; this risk was specifically relied on by the agency (*id.* at 193a).

[81] Respondent Rubber Manufacturers Association has contended that the Secretary erred in refusing to reopen the record and stay the standard for 180 days while Dr. Maibach conducted the radioactive benzene tests. Although the court below did not discuss the question, the Secretary did not err in refusing the request. This Court has never reversed a refusal by an agency to reopen an administrative record except on a showing of abuse of discretion. See *Bowman Transportation, Inc.* v. *Arkansas-Best Freight System, Inc.*, 419 U.S. 281, 294-295 (1974). Here there was no abuse of discretion. The statute itself put industry on notice that toxic substances are subject to regulation, and it was common knowledge that benzene is toxic. The central question for industry, then, was not whether the Secretary would begin to investigate exposure to benzene, but how soon he would do so (given the substantial numbers of other toxic substances subject to regulation). Industry could have begun the process of research as soon as the statute was enacted; it did not need to wait until the initial notice of rulemaking. And questions concerning the extent of absorption of benzene into the body through exposed surfaces were obvious candidates for research. The Secretary's notice of rulemaking, in any event, clearly advised industry that the proposed standard would include a prohibition against dermal contact with liquid benzene. All interested parties were invited to present their views at the rulemaking hearing. Dr. Maibach appeared on behalf of the American Petroleum Institute and presented his views. Industrial users of liquid benzene also presented their views (Exhs. 6-48, 6-59). Eventually the administrative record

The requirement that the standard be based on the "latest," "best," "available" evidence was clearly satisfied in this case. There was no radioactive benzene study in existence, although the industry had ample time to prepare one. And, as things turned out, there was no reason to wait.

Dr. Maibach's preliminary report was supplied to the agency for the first time in January 1979. It supports the Secretary's decision because it shows that benzene is absorbed through the skin and thus confirms the Secretary's conclusion that dermal contact with benzene poses a cancer risk. The attempt to perform a radioactive benzene test also illustrates the pitfalls in setting aside a standard based on the speculation that evidence can be created readily. Dr.

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was closed, and the Secretary concluded that skin absorption of benzene posed a cancer risk and issued a standard that prohibited dermal and eye contact with liquid benzene. The request to reopen came several months thereafter during a later proceeding directed solely to the issue whether the standard should be amended to exclude workplaces where the only exposure resulted from certain liquids with trace amounts of benzene. The request was not accompanied by the actual evidence sought to be added but was, in reality, merely a request that the standard be stayed for 180 days while Dr. Maibach conducted the very test that the parties were free to conduct and submit a year earlier during the rulemaking proceeding. The agency's representative refused the request on the ground that it would be inconsistent with the narrow scope of the amendment proceeding (Amend. Tr. 20-21; A. 185-186). He explained that the agency would consider such study once it was available. But the agency would not defer the standard for 180 days to await a study whose "results could not possibly be known at this time" (*ibid.*). This decision was not an abuse of discretion.

Maibach testified that the radioactive benzene tests not only would determine whether benzene is absorbed through the skin but also would answer a number of other issues, such as the effect of repeated applications on the skin, and the effect of temperature variations. The court of appeals was influenced by the prospect that "conclusive" answers to so many questions were "readily" available in a short time through a simple study (Pet. App. 26a). But the time proved to be not-so-short. Dr. Maibach's "preliminary" results were received by the Secretary one-and-a-half years after Dr. Maibach testified that his study could be completed in six to twelve weeks.[62] The results proved to be not-too-conclusive.[63] Moreover, Dr. Mai-

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[62] Dr. Maibach testified on August 3, 1977. In May 1978 the Secretary was advised by respondent Rubber Manufacturers Association that Dr. Maibach had begun his tests; the Association similarly advised the court of appeals at oral argument in June 1978 (Pet. App. 27a n.27). The preliminary report of Dr. Maibach was submitted in January 1979 in the form of an appendix to the brief of the Rubber Manufacturers Association in opposition to the petitions for certiorari. The preliminary report states that additional studies will have to be conducted. Perhaps the additional studies will be furnished as an appendix to another brief during the coming months.

[63] As to the rate of absorption, the Maibach study is subject to serious question. The study was conducted in a manner that underestimates the rate of absorption. First, the subjects were exposed to only a single dose of benzene (Rubber Mem. in Opp. App. 7a), whereas in real life some employees are exposed repeatedly to liquids containing benzene. Dr. Maibach testified in 1977 that the number of doses might well make an important difference (Tr. 2467; A. 63). Second, much of the dose applied in the Maibach study would have evaporated

bach's study did not address any issue except to confirm the Secretary's conclusion that benzene may be absorbed through the skin and to suggest that the rate of absorption depends on the amount applied.[64]

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from the skin, thus reducing the amount of benzene available for penetration. Dr. Maibach testified in 1977 that benzene is very volatile and evaporates rapidly (Tr. 2468; A. 63). The Maibach subjects were kept outdoors, which would have accelerated evaporation. Third, in the Maibach study liquid benzene was applied to the forearm of a rhesus monkey; the forearms of rhesus monkeys and humans may not be comparable for absorption purposes. Fourth, the rate of absorption through human skin varies greatly with the part of the body, as Dr. Maibach testified (Tr. 2466, 2480; A. 62, 71). Studies on the rate of absorption through the forearm thus may not indicate the usual rate of absorption. Fifth, the rate of absorption usually increases with the temperature (Tr. 2479; A. 70). The study does not state the temperature at which the subjects were maintained. Sixth, the Maibach study, which relies on a single application of benzene to the test subjects, does not take into account the fact that repeated contact with benzene can blister the skin and reduce its ability to prevent penetration. In 1977 Dr. Maibach testified that penetration normally is greater through damaged skin than undamaged skin (Tr. 2469; A. 63). Seventh, Dr. Maibach based his "preliminary judgment" about the comparative amount of benzene absorbed through the skin and inhaled through the lungs on a computation provided by respondent Rubber Manufacturers Association (Rubber Mem. in Opp. App. 10a-11a). Dr. Maibach stated that "[f]urther experiments are necessary in order to draw conclusions as to the comparative amount of benzene absorbed" (*id.* at 10a). The Maibach study itself admits several of these limitations.

[64] Dr. Maibach concluded that not very much benzene is absorbed through the skin. Even if the conclusion about the rate of absorption were reliable (but see note 63, *supra*), it would not cast doubt on the dermal contact prohibition. Because there is *some* absorption, because this adds to whatever

Dr. Maibach proposed further experiments to tackle the additional issues that the court of appeals thought would be resolved in Dr. Maibach's initial effort.

This train of events illustrates our point that industry often will be able to point to toxicological research that allegedly will provide conclusive answers to scientific uncertainties. It illustrates the mischief that can be caused when health standards are postponed in the hope that one more study will settle the matter. These considerations underscore Congress' wisdom in requiring the Secretary to consider only available evidence in discharging his responsibility to protect the health of employees.[65] If the Secretary were required to wait until the evidence had been supplied—however long that might take—the power to control the timing of new regulations would be effectively transferred from the Secretary to the affected parties, who would have every incentive to delay.

Finally, the Secretary did not violate the requirement that the standard be based on "research, demonstrations, experiments, and such other informa-

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is inhaled, and because there is no known safe level of exposure, the Secretary was required to adopt the lowest feasible level of exposure. It is unquestioned that the use of protective clothing to prevent dermal or eye contact with benzene-bearing liquids is feasible.

[65] Of course, if, after the Secretary has promulgated a standard, new evidence comes to light casting doubt on the wisdom of any standard, then any interested person may ask the Secretary to make appropriate revisions in the standard. 29 U.S.C. 655(b)(1).

tion as may be appropriate." The dermal prohibition *was* based on research, demonstrations and experiments. Moreover, this language permits the Secretary to determine the extent to which it is "appropriate" to acquire research, demonstrations, and experiments or other information in setting standards.[66] This discretion, entrusted as it is to the agency Congress believed best capable of making the expert judgment required, should be set aside by a court only on the clearest abuse of discretion. No such abuse exists here.[67]

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[66] The Senate committee, which added this language, made it clear that the phrase "as may be appropriate" modifies not only "other information" but also "research, experiments [and] demonstrations": "The committee intends that [the] standards promulgated under section 6(b) shall represent feasible requirements, which, *where appropriate*, shall be based on research, experiments, demonstrations, past experience, and the latest available scientific data." Leg. Hist. 147 (emphasis added).

[67] Although the Secretary has no independent research capability, 29 U.S.C. 669(c) permits him to contract with private organizations for "studies" to carry out his responsibilities under the Act. The extent to which the Secretary contracts for independent studies before issuing a standard is a decision concerning "how best to allocate its resources," which, at most, is reviewable only for an abuse of discretion. *Moog Industries, Inc.* v. *FTC*, 355 U.S. 411, 414 (1958); *Wisconsin* v. *FPC*, 373 U.S. 294, 313-314 (1963). Cf. *FPC* v. *Transcontinental Gas Pipe Line Corp., supra*, 423 U.S. at 333; *Utah Fuel Co.* v. *National Bituminous Coal Commission*, 306 U.S. 56, 61 (1939); *Endicott Johnson Corp.* v. *Perkins*, 317 U.S., 501, 506-507 (1943); *CAB* v. *Hermann*, 353 U.S. 322, 323 (1957); *FCC* v. *Schreiber*, 381 U.S. 279, 290 & n.17 (1965); *Vermont Yankee Nuclear Power Corp.* v. *Natural Resources Defense Council, Inc.*, 435 U.S. 519, 524-525 (1978). NIOSH, the only agency with independent research capability under the Act (29 U.S.C. 669), concluded that benzene is readily absorbed through the skin (Pet. App. 193a); and respected industrial hygienists recommended that dermal contact be prevented (*ibid.*). These considerations amply support the Secretary's decision not to wait for or acquire still another study.

CONCLUSION

The judgment of the court of appeals should be reversed, and the case should be remanded with instructions to dismiss the petitions for review.

Respectfully submitted.

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MAY 1979

APPENDIX

LEGISLATIVE HISTORY OF 29 U.S.C. 655(b)(5)

No provision similar to Section 655(b)(5) appeared in any of the bills initially introduced in either the House or the Senate. All but a few of the many bills contemplated that national consensus standards and established federal standards would be adopted as national health standards under the Act; they permitted the Secretary (or a board) to issue new standards but did not set out any criteria for these new rules. See Leg. Hist. 1-140, 599-830.

The House Committee on Education and Labor, the first committee to report any bill, drafted the first precursor of the present Section 655(b)(5):

> The Secretary, in promulgating standards under this subsection, shall set the standard which most adequately assures, on the basis of the best available professional evidence, that no employee will suffer any impairment of health, or functional capacity, or diminished life expectancy even if such employee has regular exposure to the hazard dealt with by such standard for the period of his working life.

Leg. Hist. 943. This provision (Section 6(b)(5) of the bill) was designed to deal with the deficiencies of national consensus standards and established federal standards. The House report stated (*id.* at 848):

> During the hearings, the Committee considered the degree to which it would rely upon the use of national consensus standards in the ad-

ministration of an Occupational Safety and Health Act. It determined that these standards could not be given preferential treatment, since their credibility is suspect on two grounds: first, a private organization is susceptible to the pressures of commercial trade association interests, and second, consensus standard organizations have been slow in the development and updating of present safety standards.

* * * * *

Voluntary standards set by the consensus method represent the lowest common denominator of change in the status quo that is necessary to achieve acceptance. Now that we have chosen the force of law to command acceptance of safety and health regulations, this method should not apply.

The committee felt it vital that the Secretary be allowed to overcome these deficiencies by promulgating standards that would "insure that no employees will suffer any impairment of health, functional capacity or diminished life expectancy from regular exposure to a hazard" (*ibid.*).

The Senate Committee on Labor and Public Welfare later reported a similar bill (S. 2193) with a requirement for new standards providing (Leg. Hist. 242):

> The Secretary, in promulgating standards under this subsection, shall set the standard which most adequately and feasibly assures, on the basis of the best available evidence, that no employee will suffer any impairment of health or functional capacity, or diminished life expectancy even if such employee has regular exposure to the hazard dealt with by such standard for the period of his working life. Development of such standards shall be based upon research, demonstrations, experiments, and such other information as may be appropriate. In addition to the attainment of the highest degree of health and safety protection for the employee, other considerations shall be the latest available scientific data in the field, the feasibility of the standards, and experience gained under this and other health and safety laws.

Like its House counterpart, this provision was not limited to toxic materials or harmful physical agents; it applied to all new standards set by the Secretary. The Senate report also emphasized that "so far as possible" standards were to assure maximum health protection:

> Such standards should be directed at assuring, so far as *possible*, that no employee will suffer impaired health or functional capacity, or diminished life expectancy, by reason of exposure to the hazard involved, even though such exposure may be over the period of his entire working life.

Id. at 147 (emphasis added).[1]

The Senate bill, however, substituted in Section 6 (b)(5) the phrase "which most adequately and feas-

[1] Like the House report, the Senate report also recognized that many of the consensus standards would be out-of-date and that the Secretary would need to update them through modifications and to promulgate new standards where none existed. *Id.* at 146-147.

ibly assures" for the House bill's "which most adequately assures." *Id.* at 242, 943. Senator Javits, a member of the committee, explained that the adoption of the feasibility requirement was "an improvement over the [House] bill, which might be interpreted to require absolute health and safety in all cases, regardless of feasibility * * *" Leg. Hist. 197, 418. (No one suggested at any time that the phrase "reasonably necessary or appropriate," which appeared in the definitional sections of both bills, already precluded economically infeasible standards.)

Notwithstanding the feasibility requirement, this provision was criticized on the Senate floor as "unrealistic," as imposing an "impossible" standard requiring "absolute" safety. Leg. Hist. 345, 367, 401, 423, 480-481. During the Senate debate, Senator Dominick offered an amendment that would have deleted the principal language of Section 6(b)(5) and substituted (Leg. Hist. 242, 365-367):

> Development of standards shall be based upon research, demonstrations, experiments, and such other information as may be appropriate. In addition to the attainment of health and safety protection for employees, other considerations shall be the latest available scientific data in the field, the feasibility of the standards, and experience gained under this and other health and safety laws.

Senator Dominick explained that his amendment would eliminate "the requirement in section 6(b)(5) that the Secretary will establish occupational safety and health standards which most adequately

and feasibly assure to the extent possible that *no* employee will suffer *any* impairment of health or functional capacity, or diminished life expectancy." *Id.* at 367 (emphasis in original). He proposed to do this because the Committee's bill "could be read to require the Secretary to ban all occupations in which there remains *some* risk of injury, impaired health, or life expectancy. In the case of all occupations, it will be impossible to eliminate all risks to safety and health. Thus, the present criteria could, if literally applied, close every business in this nation. In addition, in many cases, the standard which might most 'adequately' and 'feasibly' assure the elimination of the danger would be the prohibition of the occupation itself." *Ibid.* (emphasis in original).

Consideration of the amendment was delayed, however, while an attempt was made by the Nixon Administration to substitute its own bill for the Committee's bill. Senator Williams, the principal sponsor of S. 2193, opposed the substitution on the ground, among others, that the Administration's bill contained no provision such as Section 6(b)(5):

> Under the committee bill, the Secretary is required to set the standard which most adequately and feasibly assures that no employee will suffer any impairment of health or functional capacity, or diminish life expectancy, even if such employee has regular exposure to the hazard for the period of his working life.
>
> * * * * *
>
> The substitute bill is completely silent on the matter of providing statutory guidelines for the

promulgation of standards—a silence that by itself makes the substitute seriously deficient for the interests of both industry and labor.

The worker is entitled to know that standards in the workplaces are geared to overcoming safety and health hazards that are shortening his life. If he cannot have the assurance that criteria for standards are based on this consideration, he will have a program of no value to him.

Leg. Hist. 432.

The sponsor of the substitute measure, Senator Dominick, acknowledged this difference in the two bills. He argued, however, that the Administration's bill was an improvement because it would be "totally impossible" to make sure that employees "will not have any risk to his life for the rest of his life." Leg. Hist. 423. The substitute was defeated. *Id.* at 449-450.

A compromise was then reached concerning the scope of Section 6(b)(5). Senator Dominick modified his amendment to insert the present wording of 29 U.S.C. 655(b)(5). This restricted the reach of Section 6(b)(5) to "standards dealing with toxic materials or harmful physical agents." Immediately before passage of the modified amendment, Senator Dominick explained that the intent was to limit the mandate in the section to toxic substances and harmful physical agents (Leg. Hist. 502). He and Senator Williams then explained the amendment as follows:

Mr. Williams of New Jersey. * * * As I understand this amendment, it will provide continued direction to the Secretary that he shall be required to set the standard which most adequately and to the *greatest* extent feasible assures, on the basis of the best available evidence, that no employee will suffer any material impairment of health of functional capacity even if such employee has continual exposure to the hazard dealt with for the period of his working life.

* * * * *

Mr. Dominick. * * * [W]hat we are doing now is to say that the Secretary has got to use his best efforts to promulgate the *best* available standards, and in so doing, that he should take into account that anyone working in toxic agents or physical agents which might be harmful may be subjected to such conditions for the rest of his working life, so that we can get at something which might not be toxic now, if he works in it a short time, but if he works in it the rest of his life it might be very dangerous; and we want to make sure that such things are taken into consideration in establishing standards; is that correct?

Mr. Williams of New Jersey. That is exactly correct.

Id. at 502-503 (emphasis added).[2] The nature of the compromise is clear: Senator Dominick and his supporters relented by allowing some standards to be set without regard to cost, if feasible, while Senator

[2] The only other modification was to change the phrase "most adequately and feasibly assures" to "most adequately assures, to the extent feasible." No explanation was given for the shift in emphasis, but the shift suggests a preference for health protection over cost.

Williams and his supporters relented by restricting the scope of Section 6(b)(5) to special hazards (to be substances and harmful physical agents) rather than (as before) to all hazards.

The amendment, as modified, was then accepted. Leg. Hist. 503. The Senate then passed the entire bill. *Id.* at 526-528. A few days later, however, the House enacted the Administration's bill, which omitted any such requirement. *Id.* at 1112-1118, 1121.[3] In the conference, the House receded and accepted Section 6(b)(5) without change. An amendment was added to provide for temporary variances for those unable to meet the standards required by Section 6(b)(5). "Economic hardship," however, "is not to be a consideration for the qualification for a temporary extension order." Leg. Hist. 1188 (House Conference Report). The conference bill was passed by both the Senate and the House. *Id.* at 1150, 1225-1228. Significantly, at no time during the consideration of Section 6(b)(5) (or at any other time) was any suggestion made that the Secretary must estimate the number of lives that the proposed standard will save and determine whether the saving is worth the cost of the standard.

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[3] The bill reported to the House by the committee had contained such a proviso (but without any feasibility condition) (see page 1a, *supra*), but during floor debate it was criticized once again as "unrealistic" and as an "impossible burden" on employers. Leg. Hist. 1053, 1087-1088. Once again, such criticism would have been unwarranted if the phrase "reasonably necessary or appropriate" already moderated the scope of permissible standards.

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